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# HEALTH

A Handbook of Suggestions  
for  
**Teachers**  
In Public and Separate Schools



THE RYERSON PRESS-TORONTO



# HEALTH



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# HEALTH

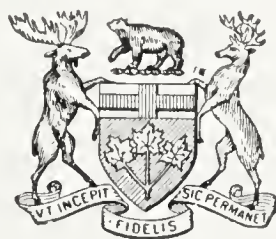
A HANDBOOK OF SUGGESTIONS

FOR

## TEACHERS

IN PUBLIC AND SEPARATE SCHOOLS

*Prepared by members of a Joint Committee on the  
Teaching of Health, appointed from the Depart-  
ment of Education and the Department of Health  
of the Province of Ontario*



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ONTARIO  
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## MEMORANDUM

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TEACHERS using this Handbook will observe that the grading of the instructional material in Health is not in conformity with the recently revised courses of study for Grades I - X. This need not cause any difficulty; teachers may make full use of the suggestions for the teaching of Health as offered in the Handbook, but should observe the grade placement of the various topics as given in the authorized courses of study.



## FOREWORD

The Handbook on Health is the result of an experiment in health teaching conducted by the Department of Health in conjunction with the Department of Education. This experiment was initiated by Dr. J. T. Phair, Chief Medical Officer of Health for the Province. Through the offices of Mr. V. K. Greer, Chief Inspector of Public and Separate Schools, the co-operation of six Inspectors was obtained. These Inspectors, in turn, enlisted the services of a number of progressive and interested teachers who were prepared to undertake the work.

The initial phase of the experiment took the form of a demonstration in health teaching in the elementary schools of the Province. These included ungraded rural schools and graded classes in city, town, and village schools. Sixty-one teachers and about 2,500 pupils took part in the demonstration, which extended from September, 1931, to May, 1932. Each teacher was supplied with an outline of the proposed course of instruction, materials for planning and preparing the content of the course, suggestions for activities and methods of procedure, and the technical and scientific information necessary to furnish a rational basis for the teaching.

Every teacher was visited twice by the directors of the experiment during its progress, and the inspectors concerned were consulted from time to time. At the conclusion of the demonstration a critical review of the programme of instruction and an evaluation of the materials, devices, activities, procedures, and results were secured from the teachers who had taken part. The observations of the directors, together with the criticisms and suggestions from the teachers and inspectors, were embodied in a report submitted in November, 1932, to the Minister of Health and the Minister of Education. Following the submission of this report a Joint Committee was appointed by the Prime Minister from the staffs of both departments to consider the report and to make recommendations for the adoption of a scientific programme of health education for all the elementary schools of the Province. The personnel of the Joint Committee was as follows:

Department of Education: V. K. Greer, M.A., Chief Inspector of Public and Separate Schools; Duncan Walker, B.A., Director of Professional Training; Robert H. Roberts, M.A., Inspector of Public Schools; G. R. Smith, B.A., B.Paed., Provincial Normal School, Ottawa. In 1936, on the retirement of Mr. Walker from the position of Director of Professional Training, his successor, Dr. W. J. Karr, became a member of the Joint Committee.

Department of Health: John T. Phair, M.B., D.P.H., Chief Medical Officer of Health; Mary Power, B.A., Director of Health Education; Laura W. Vrooman, Reg.N., Division of Child Hygiene.



The activities of the Joint Committee have been directed along the following lines:

1. The preparation of a handbook in health education.
2. The organization of a summer course in health education for teachers-in-service.
3. A demonstration in health education in the Provincial Normal School, Ottawa, during the session 1934-35.

The Handbook in its original form was compiled for use in the first Summer Course in Health Education, held in 1933 under the joint direction of the two Departments. During the school year of 1933-34 it was tried out in the class-room by the teachers who had attended this Course. Criticisms and suggestions resulting from the trial given under actual class-room conditions were then embodied in the first printed edition in 1934. This edition was limited to 1,000 copies, distributed, for further trial, among teachers who had attended the Summer Courses of 1933 and 1934; also to Principals of Normal Schools, Inspectors of Public and Separate Schools, 150 selected teachers, and students in attendance at the Ottawa Normal School during the session of 1934-35. At the end of this school year a questionnaire was sent to all those who had received copies of the book and the suggestions and criticisms received have served as a valuable guide in the compilation of the present edition.

The Handbook is submitted for use in schools, not as a final guide, but as an experimental and tentative outline of procedure. It is hoped that the teachers will accept it as such, record their observations and suggestions, and forward them to the Department of Education. Such observations and suggestions should prove of great value in future revisions.

The Committee is indebted to numerous individuals and organizations for suggestions and assistance in compiling the Handbook. The list includes hundreds of teachers and inspectors throughout the Province, as well as officials representing provincial, state, and civic departments of health, universities, teachers' associations and colleges, medical associations, insurance companies, welfare councils, tuberculosis and hygiene associations, child welfare associations, and other kindred organizations both in Canada and in the United States. Special acknowledgments are due also to the numerous publishers who have furnished books for examination and reference purposes. The large number of contributors, unfortunately, precludes the possibility of individual mention. The Committee desires to convey to all those who have co-operated in any measure in the preparation of this volume its grateful acknowledgment of the assistance they have so freely and generously given.

TORONTO, *April, 1938.*



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# PART I

## NEED AND MEANING OF HEALTH EDUCATION

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### CHAPTER I

#### NEED OF HEALTH EDUCATION IN THE SCHOOL

Evidence of the need of health education in the school is constantly before health and educational authorities. In the Province of Ontario the time lost from school because of illness, much of it preventable, is thirteen days per pupil per school year. This represents a loss of nearly seven per cent. of our educational effort, since a child who is out of school ceases to benefit from organized school education. Illness is also responsible for a large percentage of retardation. Measured in money, the wastage of public funds due to illness is a matter of grave national concern. But more important than the wastage of time and money is the lowering of the quality of educational achievement. Illness thus adversely affects the welfare of the individual child, impairing his physical capabilities, retarding his mental and emotional development, and seriously affecting his attainment of economic and social security.

During school life the average child acquires habits of living, some of which are good and some of which are bad. His health status is determined for the most part by the practices and knowledge of his parents. In the homes of many children the newer knowledge of nutrition is not applied in matters of food, sleep and rest, sunshine, play, and recreational activities. The child does not possess adequate scientific knowledge which will help him to understand the reasons for certain practices. He is oftentimes influenced by dogmas, either those of his race or of his family. Unfortunately, the health knowledge which he acquires at school is too often a matter of substituting the dogmas of the teacher for those of his home and his associates.

He has vague ideas regarding the nature and spread of communicable diseases and he rarely knows the reasons for the existence of measures for their prevention and control. He is more often impressed by the hardships associated with quarantine than by the protection it affords to himself and to others. He has no accurate scientific knowledge to guide him in the formation of good personal habits. That the school is not furnishing adequate direction in such an accepted matter as personal cleanliness is evidenced by the serious lack of hand-washing facilities in many schools of the Province. Even where such facilities are provided, there has been little intelligent use made of them by teachers to stimulate the child's interest in personal and community cleanliness.

In many parts of the Province, representing a wide variation in economic and social life, appraisals of the health status of school children have been undertaken by doctors, dentists, nurses, and consultant psychologists associated with the school health services. Since these surveys have included both urban and rural communities, the findings may be considered typical of conditions prevailing throughout the Province. It was found that sixty per cent. of those children who were completing the elementary school course had decayed permanent teeth. More than ten per cent. of all children who had reached Grade VII had vision defects of a degree sufficiently serious to require regular professional treatment. In every class-room examined, one or more children were handicapped by impaired hearing. A serious social and economic problem is presented by the large number of children in the schools who show hearing loss so marked that they are faced with potential deafness.

These studies reveal the unsatisfactory health conditions existing among the children in the elementary schools of the Province and the pressing need for a scientific type of health education.



## CHAPTER II

### HEALTH EDUCATION—DEFINITION OF TERMS

Health is not to be regarded as a formal subject on the school curriculum. It is rather a quality of living related to all the experiences of the child in his home, in the school, and in his associations with others. It extends throughout life and may be defined as the capacity of the individual to continue adaptive effort physically, mentally, emotionally, and socially. Health education is accepted as one of the important administrative aspects of general education, since it provides a scientific basis for appraising the effectiveness of educational purposes, procedures, and materials.

Certain technical terms are now found in literature pertaining to health education. These have been accepted by educational and health service authorities. They have been used in this handbook and it is deemed desirable that they be defined at the outset. These definitions should aid the teacher in his interpretation of the handbook and in the understanding of any further reading he may undertake in the subject of health education.\*

**Health Education** is the sum of all experiences which favourably influence habits, attitudes, and knowledge relating to individual, community, and racial health. This is a general term covering the twenty-four-hour-day health behaviour of the individual. The experiences that emerge from and are identified with school life are specifically defined by the term *School Health Education*. They take place in school or through efforts organized and conducted by school personnel. For the sake of brevity, and since this handbook is for use in the schools, the term *Health Education* will be used instead of the longer term *School Health Education*.

**Healthful School Living** provides a wholesome environment, the organization of a healthful school day, and the establishment of those teacher-pupil relationships which make for a safe and sanitary school, favourable to the best development and living of pupils and teachers.

Healthful School Living is concerned not only with the physical environment of the school but it also includes all the learning experiences that take place during the school day. Trustees and administrative officials are primarily responsible for the physical condition of the school grounds and school buildings, while the supervisory and teaching staffs are responsible for the educational processes. There are many modern school buildings equipped with the best facilities to affect the health of the school child, but the lack of appreciation

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\*The report of the Committee on Terminology of the Health Education Section of the American Physical Education Association—1935.

of the value of these on the part of the teaching staff has to a very large extent discounted the provisions made by trustees and administrators. On the other hand there are many schools which lack modern facilities and yet the interest, knowledge, and enthusiasm of the teaching staff have created a healthful school environment where the child may live under most favourable conditions.

**Health Instruction** is the organization of learning experiences directed toward the development of favourable health practices, attitudes, and knowledge.

**Health Service** comprises all those procedures designed to determine the health status of the child, to enlist his co-operation in health protection and maintenance, to inform parents of existing defects, to correct those that are remediable, and to prevent disease. Health Service is accomplished through the combined and co-ordinated efforts of administrative and teaching staffs working with parents and various health agencies outside the school. The technical work is carried on by medical, nursing, dental, psychiatric, nutritional and other specialists in close co-operation with educational officers and teachers.



### CHAPTER III

## HEALTHFUL SCHOOL LIVING

There is a growing conviction among educationists that more important than any programme of health instruction or any organization of medical, dental, or nursing services is the provision for healthful school living.

The health behaviour of the child extends through the twenty-four hours of the day. The responsibility for it is, therefore, shared by the child, the parent, and the teacher. It is important that the child's life possess a continuity of health experiences arising out of all life situations in the home, the school, and the community. Each school, and each class-room in the school, will have its own health problems just as each child will have his individual problems. The teacher who is with the pupils throughout the school day will be able to discover the needs and capabilities of each child. From the daily life experiences of the child in the school, in the home, and in his associations with others, the teacher should recognize those that have significance in influencing physical, mental, social, and emotional well-being. Health education is essentially activity, living, and experimentation, rather than formal teaching. The influence of the teacher is second only to that of the parent in developing desirable health practices, habits, and attitudes.

The teacher introduces the child to a new world. It is a world outside his home and all the activities and associations centred about his home life. The world of the school becomes for the child his entry into that larger world of adult life in which he should find a complete and happy mode of living. It is the first responsibility of the teacher to give to each child a feeling of security and adequacy. Fear produces anxiety states and disturbs what is most important to the child, his feeling of security. The teacher should so organize school life that there will be no fear in any pupil-teacher relationship or in the associations of the children with one another. Many children enter school lacking a feeling of adequacy and of confidence. The teacher should provide school experiences worth-while to the child through which he may attain some measure of success. This procedure will tend to give him increasing confidence and self-reliance.

A regimented school or class-room which insists upon each child attaining artificial standards in behaviour and achievement makes impossible the best type of pupil-teacher relationship. In this type of school the child who is diffident and non-aggressive becomes discouraged, lacking in self-confidence, over-anxious, and disturbed. The active, confident child finds his efforts unduly restricted. Where no consideration is given to individual capabilities

problems of discipline affecting the health of the children are likely to occur. Because of its insistence on standardization, the regimented school too frequently leads to mediocre accomplishments. It does not develop initiative, responsibility, and resourcefulness, nor does it help the child to understand the complexities of modern life so that he may bring his own life in harmony with the lives of those about him.

On the other hand, the sentimental type of school organization substitutes aimless drifting for progressive achievement. It does not challenge the best efforts of the child nor does it prepare him to meet courageously situations in his later adult life.

Healthful School Living means the organization of all the experiences throughout the school day so that each child will have many and varied opportunities to explore his individual capacities and to secure satisfactions from cumulative successes in a safe and sanitary school environment.

**School Site.** The physical environment of the school includes all those factors connected with the school site, the playgrounds, and the school buildings. The school site should be well-drained and accessible to all children without undue hazards from highway and street traffic. As far as possible it should be removed from traffic congestion, noise, smoke, industrial fumes, or other conditions detrimental to the physical and moral life of the child. In the selection of the site future expansion to meet increasing school population should be given consideration.

There should be playground space; and, in addition, provision should be made for school gardens, lawns, trees, and shrubberies. School gardens provide creative and recreational activities for the child. They may be utilized to furnish food materials which have a definite relationship to his growth.

**Playground.** The playground should have ample space for play to be carried on with freedom and safety for children of all ages. The play period has an influence upon the child's physical health, but more important is its contribution to the development of emotional and social maturity, since through play the child learns how to live happily with others. Whenever possible the play period should be out-of-doors; therefore, the playground should provide opportunities for every child to engage in seasonal activities. Elaborate and expensive equipment is not necessary, but it is important that the equipment should be safe, varied, and interesting to the pupils.

**School Building.** The school building should be free from all hazards of fire and accident. Stairways and corridors should be well-lighted and of sufficient width to permit free movement of the pupils at all times. The class-room should be planned to accommodate not more than forty children, since it is now recognized by educational authorities that this is the maximum number to be assigned to any class-room. There should be provision for each



child to hang up his outdoor clothing and to dry his wet and damp clothing. Shelves or cupboards for the storing of school lunches should also be provided. The lunches should be protected from flies, mice, dogs, etc.

**Water Supply.** A convenient and ample supply of safe drinking water should be available to every school. Where there is a community water system sanitary bubbler fountains should be used. These should be placed conveniently throughout the school. Where drinking water is secured from a well, every care should be taken to protect the supply from pollution. Frequent examinations should be made by laboratory tests. In schools not provided with sanitary drinking fountains individual drinking cups should be supplied by the school or brought from home. Many so-called sanitary bubbler fountains which do not ensure sanitary drinking facilities have been installed. School boards should secure advice from technical experts before purchasing such equipment. All drinking fountains should be so regulated that the flow of water makes it possible for even the smallest child to secure a drink without putting his lips to any part of the fountain.

**Hand-washing Facilities.** Facilities for hand washing, including basins, paper towels and liquid soap, should be provided in each school. Hand-washing should become an individual habit. Its importance after going to the toilet and before touching food should be realized by each child.

**Toilets.** Separate toilet accommodation for boys and for girls should be provided. There should be daily inspection and supervision of the toilets, since proper use and care of these by the children are important factors in healthful school living.

**Rest Room.** In every school there should be a small rest room where a child showing excessive weariness or signs of illness may lie down. In schools where nursing services are provided the nurse's room may be used for this purpose. The rest room should be equipped with a couch, paper towels, sanitary paper handkerchiefs, scales, a measuring rod, and a first-aid cabinet provided with a lock. Where it is impossible to have a separate room, a section of the class-room, shut off by screens, will serve as an improvised rest room.

**Lighting.** Reading, writing, and other class-room activities make heavy demands upon the vision of school children. It is important, therefore, that the lighting of the class-room should provide the best possible conditions which will enable the child to do his work without incurring any injury to his vision. In a preceding chapter attention has been drawn to the large number of vision defects among school children. In recent years important advances have been made in the study of the science of lighting and these findings are now available to administrative officials responsible for the lighting of school buildings and to all teachers concerned in the conservation of the sight of the school

child. The conclusions reached emphasize the importance of securing plenty of light and of arranging that this light be distributed without glare to every part of the class-room.

The lighting of the class-room is primarily a matter of planning and construction and belongs to the field of the administrative official rather than to that of the teacher. There are, however, certain factors which influence class-room illumination. These should be understood by the teacher and may become life situations with important health content for the children.

Natural lighting depends upon sky brightness. During the fall and winter months in the Province of Ontario there are many days on which the sun is obscured and the amount of natural light in the class-room is seriously reduced. Latitude is another factor which must be considered if any standards are being applied to determine the adequacy of natural lighting. A given amount of glazed area facing in a certain direction in Toronto will not give the same amount of illumination as it would in North Bay. The significance of this factor becomes of increasing importance when uniformity of design for school buildings is suggested.

The orientation of the school buildings is important; a class-room with a southern exposure will receive more light than one facing east, north, or west. It should be noted that if outside objects such as trees or other buildings are too close to the building a considerable portion of the available light will be cut off from the class-room.

The size of the class-room affects the lighting. The width of the room is important since there must be adequate lighting for the row of seats farthest from the window. For this reason the width of the room should not be greater than twice the height. For satisfactory class-room illumination where the light comes from windows placed along one wall the following maximum dimensions have been fixed: length 32 feet; width 24 feet; height 12 feet.

The amount of window space should be at least one-fifth of the floor space. Since the majority of children write with the right hand the light should enter from the left so that the pupils do not cast a shadow over their work. The windows should be placed on one wall of the room and they should not extend beyond the front row of seats.

Since the light that is diffused to the inside rows of desks comes from the upper part of the window, and since one-half of the light which enters the class-room comes from the upper third of the window, it follows that the window should be extended practically to the ceiling. The upper part of the window should not be covered with blinds, curtains, or any decorations which will shut out the light. The cleanliness of the glass is also an important factor. It has been estimated that dirty windows shut out some twenty-five to fifty per cent. of the available light. Frequent washing of class-room windows, inside and out, throughout the school year is essential if the best natural lighting is to be secured.



Then, too, the light-reflecting qualities of the walls and ceiling have an important influence upon the illumination of that part of the room farthest from the windows. A matt surface finish overcomes glare. The lighter the colour the greater the diffusion of light. The walls should be light cream or light grey in colour, and the ceiling white. Since dirt decreases the reflecting power of the walls a washable paint should be used. Blackboards absorb an excessive amount of light and seriously reduce the illumination of the class-room. Because of this fact the amount of blackboard space in many schools is being materially reduced.

Suitable blinds or shades are essential to control the light of the class-room. These should be of translucent material. A loosely woven wide mesh canvas either of white or of ivory colour, has been found to be most effective since it limits the entry of direct rays of the sun while admitting a maximum of light. There should be two sets of blinds, one pulling up and one down from the middle of the window. A flap should cover any space left between the two blinds. The blinds should extend two inches beyond the edges of the window. The teacher should recognize the importance of keeping these blinds properly adjusted during the school day to meet the varying degrees of light and to provide the most effective lighting. Participation by the children in this matter provides interesting and valuable health experiences. Curtains and other decorative hangings reduce the amount of light and their use is open to serious question. The protection of the vision of the children should receive first consideration.

Having in mind the number of school hours during which the sun is obscured in Ontario, natural lighting is inadequate for the majority of class-rooms in the Province, in which cases it is necessary to use some form of artificial light. In the installation of artificial light advantage should be taken of the free consultative service offered by recognized authorities.

**Heating.** School heating is a necessity for many months in the year in Ontario. Administrative officials are concerned with the engineering aspects of mechanical school heating systems and it is not intended to discuss them in a handbook for teachers. There are, however, certain considerations regarding efficient school heating which should be understood by the teaching staff. In every school, whether a one-room school or a many-roomed building, the health and comfort of the children require a constant supply of heat sufficient to maintain in all parts of the class-room an even temperature ranging between 65° and 70° F. The overheated class-room and the insufficiently heated class-room are detrimental to the health and comfort of both children and teachers. Many schools are provided with central heating systems, and in these cases there is usually adequate distribution of heat throughout the class-room. Where a stove is used it is imperative that a jacket should be provided, as this is the only means of distributing the heat throughout the room so that

those children who are seated near the stove are not receiving too much heat while those seated far away are receiving too little. A jacket is easily constructed and consists of a metal sheet completely surrounding the stove, and extending from about eight inches above the floor to about twelve inches above the top of the stove. The metal sheet is fitted with a hinged door at the front. The cool air is drawn under the jacket and upward by the heat of the stove. It becomes heated and continues to rise, causing a circulation of the air throughout the room.

**Ventilation.** Good ventilation is essential to the health and the efficiency of both teacher and pupils. It affects the quality of the teaching and the achievement of the children. In the past, attention was directed to the chemical properties of the air with emphasis on its carbon dioxide content. Experimental studies have shown that carbon dioxide is a negligible factor and that the physical properties of the air are more important than the chemical. The fundamentals of good ventilation are air movement, temperature, and humidity.

For good ventilation it is essential that the physical condition of the air is such that the body can maintain its normal temperature with ease and comfort. This means that the air should have a cooling effect and should help to carry off heat from the body without putting undue strain on the body's heat-regulating mechanism. A variable rather than a continuous one-direction movement of the air is desirable.

Investigations have shown that mechanical or automatic systems fail to provide the essentials of good ventilation. In the modern types of schools, more reliance is now being placed upon window ventilation. Opening the windows provides air movement and also helps to regulate temperature and humidity. This simple system of ventilation by windows functions throughout the year, is easily controlled, and is always in order.

If the windows of the class-room are built so that they open top and bottom, ventilation presents no serious problem. It is obvious, however, that draughts should be avoided. Deflector boards should be fitted to all windows to prevent draughts from striking the pupils. The making of these boards will form a valuable exercise in manual training and will have a direct relationship in the minds of the pupils with a real life situation.

Heating and ventilation are closely related. The informed and interested teacher will assume direct responsibility for the air conditions of his own class-room. The temperature should be ascertained by reference to a thermometer, which should be hung on a level with the pupils' heads. The best temperature for comfort and health will range between 65° and 70° F. The reading of the thermometer and the recording of the temperature should be daily procedures in every class. There are many learning experiences for the pupils in the regulation of the heating and the ventilation of the class-room. The teacher should secure the co-operation and participation of the pupils,



who will learn, even in the junior grades, that the temperature and the ventilation of a room have important influences on their own comfort.

**School Furniture.** Individual seating is recommended in the interests of health. The child should sit so that his feet are resting squarely on the floor with no pressure under the knees. The desk should be of sufficient height to enable him to work comfortably with the trunk and the head in an erect position. Where adjustable seats are provided the teacher should make sure that each child is placed in a seat which meets his individual needs. Throughout the year the teacher should make sure that the growing child continues to be comfortable. Movable seats and desks make better cleaning of the class-room possible and lend themselves to the newer type of class-room activities. Individual tables and chairs have long been recognized as standard equipment for primary and junior classes. Since in adult life the child will use such furniture, many schools are introducing individual tables and chairs for children in all grades. At the beginning of the term the teacher should ascertain if there are any children with defects of vision or hearing. The seating of these children should receive special consideration. Children suffering from orthopedic and similar defects should also be made as comfortable as possible.

**Blackboards.** The blackboard should be made of the best grade of slate, free from flaws, veins, or other defects; the finish should be velvet-like in texture and uniformly black in colour. The best position is on the front wall of the class-room. A blackboard should never be placed between windows. When attached to the rear wall or to the wall opposite the windows it absorbs light and reduces the illumination of the inner part of the class-room. For this reason many schools are now using a light-coloured bulletin board to replace the blackboard on the inner walls.

The blackboard should be equipped with a trough for chalk. This should be covered with a removable wire screen which will allow the dust to collect underneath. The best method of cleaning the blackboard is by means of a cloth moistened with coal-oil. The children should not be allowed to clean blackboards since it is possible that the chalk dust may be harmful to the child.

All writing on the blackboard to be read by the children should be done by the teacher; it should be large, well-spaced, and legible without eye-strain to children seated in the farthest seats. Chalk of a diameter of one inch has been found most serviceable. Chalk of this size eliminates the possibility of small or crowded writing.

Since the ability to write on a blackboard has no value to most adults blackboard writing by pupils is being seriously questioned by educationists. Health authorities are aware of the unnecessary tension involved when children are required to do work of this nature. Even a short time may involve serious strain on some pupils. Only too frequently it is the child who should

not be subjected to such strain who is sent to the blackboard. Requiring children to do such work may give rise to problems affecting their mental and emotional life.

**Care and Cleanliness of the School.** The responsibility for a clean and attractive school is shared by the pupils, the teacher, and the caretaker. Their common purpose should be to work together to create and maintain the best conditions for healthful and refined living. During the day the pupils and teacher should use the school property so that there will be no unnecessary and increased work thrown upon the caretaking staff. The atmosphere of neatness and orderliness prevailing throughout the day will directly influence the standard of caretaking. The work of cleaning the school should not begin until the pupils and teacher have left the building. Since the time at his disposal for cleaning the school is limited, the work of the caretaker should not be delayed by pupils and teachers. The best co-operation the teaching staff can give the caretaker is to place the school at his disposal immediately after four o'clock.

The caretaker should be an adult who, besides possessing the knowledge of the fundamentals of heating, ventilation, sanitation, and cleanliness, is interested in making a direct contribution through his work to the health and comfort of the pupils and teachers. Each member of the caretaking staff should be in good health and of good moral character, since he is in close contact with children of all ages. If the caretaker is to secure the respect and co-operation of pupils and teacher, he must give attention to his personal habits. The selection of the caretaker should receive intelligent consideration by administrative officials. Informed, enthusiastic, and progressive principals and teachers are helpless to provide the best conditions for a safe and healthful school environment if their efforts are frustrated by an unqualified, careless, and indifferent caretaking staff.

**Assembly and Dismissal.** There are certain procedures connected with the daily school life of the child which are a recognized part of all school organization. These procedures may be used by the teacher and by the school personnel to promote the health of the children. Informal assembly and dismissal may make positive contributions to the health of the child, and may afford learning experiences in the process of socialization. There should be an element of individual responsibility in the movement of all pupils through the corridors and in the class-room. The child should learn during school life to move with facility, self-confidence, and self-responsibility. The practice of having the children line up and march into and out of school is wasteful of time, unmindful of serious individual physical disabilities and limitations and of important social experiences. It is oftentimes the cause of unnecessary problems of discipline with resultant emotional disturbances of both teacher and pupils. The procedures of the school should approximate those of adult life.



**Opening and Closing Exercises.** The best conditions of learning are those in which the child can give voluntary attention. Studies made by industrial hygienists have shown that in industry the frequency of accidents increases when workers are emotionally upset, with a resultant decrease in attention. Emotional disturbances may decrease the child's capacity for attention. These disturbances may arise in the home, on the way to school, or on the playground. The teacher should not regard inattention and restlessness at the opening of school as problems of discipline. The opening exercises may be used to promote a condition of calm for each child. This is the essential prelude to the best type of voluntary attention. It is possible to command the attention of the child, but attention so gained is forced and artificial. Opening exercises should always be informal and should vary from day to day in keeping with the needs of the children, their changing experiences, and seasonal phenomena. An element of variety will add interest. Each child should be encouraged to participate and to contribute something to these exercises, even though his contribution may appear to be slight.

Before the child leaves school at the end of the day there should be a period of ten or fifteen minutes for closing exercises. These should be informal and should vary from day to day.

Many children hurry through their work in order to secure the reward of early dismissal. Such motivation tends to diminish the quality of effort. The child who has given his best efforts and who is kept in to complete work is likely to feel resentful against the school organization. He may become discouraged and develop feelings of insecurity and hopelessness.

Each child has lived throughout the day in the school community. At the close of the day he should leave with a feeling that he has a place in the scheme of things. He should not be given false standards of personal superiority, nor should he leave the school depressed, discouraged, or resentful. Closing exercises should give to each child a feeling that he has accomplished something worth-while and that he has had some share in the activities of the day. This will contribute to the development of his self-confidence and will help him to meet problems in his home and community life with courage and without fear.

**Morning Health and Cleanliness Appraisal.** The class-room programme should be so arranged that at the opening of school there may be an opportunity of appraising each child by the teacher. The procedure should not be formal or standardized. Characterized by initiative and originality, the health appraisal may have important learning experiences for both teacher and child. Many teachers combine it with the individual friendly morning greeting.

The main purposes of the appraisal are to determine whether the child is fit to participate in all school activities; to ascertain whether or not he is

observing those practices which are conducive to health and cleanliness; to observe any deviation from normal health; and to note any symptoms of communicable disease. It follows, therefore, that the daily health and cleanliness appraisal should be made by the class-room teacher. In no circumstances should one child be given any responsibility in the appraisal of another. Life situations growing out of these appraisals and utilized by the teacher will make interesting contributions to the work in health instruction.

When a child returns to school after illness the teacher will have an opportunity during the morning appraisal to advise him, if necessary, against attempting a full day's programme. He should be given permission, without further request, to rest when he feels the need.

The appraisal also makes it possible for the teacher to give assurance that he is sympathetically interested in all of the child's problems. The solving of these problems should be in keeping with the customs prevailing in the school and community.

If a child appears neglectful of certain health practices and it is necessary to draw his attention to the fact, the teacher should do so in private, remembering that the home has an important influence upon the condition of the child when he arrives at school. The teacher's own example will have the greatest weight in matters relating to personal cleanliness, neatness, orderliness, and attention to recognized health practices.

**The Daily Programme.** The teacher should plan the daily programme so that the child is not engaged for too long a time in any one type of work. Construction work, looking up references in the school library, physical activities and those which require the child to move about should have a prominent place in the daily programme.

The organization of the class-room should make it possible for the child to go to the toilet, to get a drink, to sharpen a pencil, or to secure a book, without asking permission. He should be given increased responsibility in matters pertaining to his personal needs. There are important learning experiences connected with physical and social health arising from such personal problems. The responsibility of the child will vary in the different grades. In the junior grades the teacher should make sure that every child realizes the importance of going to the toilet and getting a drink when necessary. The teacher should not assume the responsibility of making decisions for the child in matters of personal health. The large number of fatalities from appendicitis among Ontario school children every year is reason for serious study of toilet practices in our schools.

In some of the newer schools, toilet and hand-washing facilities are being installed in the cloakrooms adjacent to the individual class-rooms. This approximates a life situation which the child will find in his home.



**Homework.** The child needs to play out-of-doors. For his growth he requires an adequate amount of sleep. Homework which curtails the child's time for recreation and sleep is open to serious question. There are types of homework which have important values in linking up the activities of the school with the child's home and community life. These types give the child an opportunity for outdoor and creative activities and may lead him to explore his own latent abilities. Such homework becomes a contribution to his physical, mental, and social health.

**Rest and Relaxation.** There should be a short period of rest for all children after morning assembly, after recess, and after the noon lunch period. Irrespective of age, all children should have a short period of rest after strenuous play and after eating.

Relaxation not exceeding five minutes should be arranged in both morning and afternoon sessions when the children should be free to leave their seats and move about the room. In many schools children bring fruit or vegetables, a drink of milk, tomato or fruit juice to use at this time. Many teachers take the children out-of-doors to play a short exhilarating game. This period should always remain informal and should retain the play element, combining physical and mental relaxation. During the indoor relaxation the windows should be opened and the blinds raised. The teacher should ask the pupils to make suggestions regarding procedures and activities which may be carried on. These periods offer valuable learning experiences for the children.

**Recess.** The Regulations of the Department of Education provide that there shall be at least one hour allowed for recreation at mid-day and at least ten minutes during each of the forenoon and afternoon sessions. In no circumstances should there be detention of a child at recess. Recess has been provided in the interests of the health of the children and the teacher. The child should have an opportunity for play. Play contributes to his physical well-being, but more important than the physical aspect are the mental, emotional, and social contributions. The child must learn to get along with others. The procedures of the class-room do not provide sufficient opportunity for social experiences. It is on the playground that the child will have the best opportunity to develop the social and emotional aspects of his own life. Many of the leading industrial, commercial, and financial institutions have found that a recess period for adult employees improves not only the health of the employees but also the quality and quantity of the work accomplished. The teacher should take advantage of the recess period to go out-of-doors and gain relief from the pressing and immediate problems of the class-room. The quality of work of both teacher and pupils is improved where full advantage is taken of the recess.

**Noon Lunch.** All children should have the entire noon-lunch period free. The child who goes home for lunch requires this period to wash, eat his lunch

without hurry, rest, and have some time for recreative play. The child who brings his lunch to school should have an opportunity for gaining important health experiences, which may grow out of the noon-lunch period. The children should prepare for lunch by washing their hands. They should sit down to eat. The lunch time should be marked by unhurried eating, cheerfulness, and by the practice of social amenities. The selecting and the preparing of the hot dish should be regarded as contributing to a balanced meal by supplementing what has been brought from home. The selection of food in the child's own lunch, the wrapping and the care of the lunch may become part of the health instruction. Cleaning up after lunch (with the disposal of crumbs, refuse, and paper) and the washing of dishes are essential factors in teaching cleanliness. The storing of food to keep it clean and protect it from flies and mice, and the placing of lunch boxes on shelves and in cupboards may be used as a basis for health instruction in the preservation of foods.

Studies of the health of school children have shown that there is a decided improvement in the health of the child and in his capacity to undertake the work of the afternoon session if one hot dish has been included in his noon lunch. The special grants of the Department of Education make it possible for every child who carries his lunch to school to have such a hot dish during the winter months. The responsibility for this important health service rests with the local trustees and the teacher.

**Weighing and Measuring.** Growth is an index to health. Every child wants to grow and this desire is a splendid motivating force to encourage him to practise satisfactory health behaviour. Absolute weight by age and height as an index to growth has been over-emphasized in the past. What is desired is that the child shall show evidence of regular gain, both in height and in weight. Ordinarily, children increase in height in the late summer and early fall at a greater rate than at any other time of the year. Children should be measured three times a year and weighed monthly. In the junior grades, class records should be made of the child's weight and height. In the intermediate and senior grades the child should keep his own personal record. The class-room teacher weighs and measures the child to interest him in his growth and to give him a means of proving for himself the relationship between health practices and growth.



## CHAPTER IV

# THE TEACHER AND HEALTH EDUCATION

**Health Education is the Responsibility of the Class-room Teacher.** Since a complete plan of health education includes the development of satisfactory habits and the formation of desirable attitudes, together with the imparting of knowledge, health education must be made an integral part of the daily life of the child and must be correlated with all subjects on the curriculum. To the teacher is given an opportunity to exert great influence on such habits and attitudes.

Under the guidance of the class-room teacher, health becomes not a subject on the curriculum but the corner-stone upon which the school day is built. The knowledge of the teacher in regard to the health needs and limitations of the pupils, individually and collectively, will be the basis of the daily schedule for periods of teaching and study, rest and relaxation, recreational and physical activities.

A satisfactory programme of health education is one developed in the class-room itself. Anyone other than the class-room teacher may enter the room prepared to interpret the health programme in terms of doing, but the limited time at the disposal of an outsider changes what should be a period of experiment, activity, and living into one of formal teaching. The continuity of learning is broken if health is isolated from other experiences of the school day. But, more important still, no one but the teacher possesses the personal knowledge of the health needs of the individual pupils. It follows, therefore, that the intelligent, understanding, imaginative, and resourceful class-room teacher is the foundation of effective health education. He alone is capable of applying the fundamental principle, that attitudes and habits are established through sustained practice and progressive and assimilable knowledge.

Each school, and each class in the school, has its own health problems, just as each child has his own individual health problems. The teacher who is with the pupils throughout the school day is best qualified to discover the needs and capacities of the individual pupil and the hygienic requirements of the school. From the 24-hour daily life of the child in the home, in the school, and in his associations with others, the teacher should use those experiences which have significance in developing physical, mental, emotional, and social well-being.

The influence of the teacher is second only to that of the parent. Because of this he will be able to help the child to develop desirable health practices, habits, and attitudes. With the assumption of this responsibility the teacher

becomes more interested in the individual child,—his needs and his accomplishments, his limitations, and his capacities. Relieved of the responsibility for the health of the pupils, the teacher either remains uninterested or loses whatever little interest he may have had.

Since modern health education is built about the individual class-room and the responsibility is placed upon the class-room teacher, it is important that the teacher should possess those qualifications which will make his direction positive, scientifically accurate, and in keeping with progressive trends in education.

**The Preparation of the Teacher.** The progress of health in a community depends upon the application of the scientific discoveries pertaining to health and the prevention of disease to the everyday behaviour of the individual and of the community. The teacher is the interpreter to the child of the discoveries made by the scientist, and these in many cases are carried into the home from the school. It follows, therefore, that the teacher must make all scientific and technical knowledge understandable to the child in terms of his personal conduct. If this knowledge is to influence his conduct it must be presented to him not as formal instruction, but in terms of behaviour through actual participation in real life situations. The scientific knowledge thus acquired will help the child to understand the reasons for his personal health practices and for those of the various social groups of which he is a member. The child must have opportunities in his school life to engage in healthful practices. This will require facilities which exemplify accurate and scientific health knowledge. Since modern health education rests upon a biological foundation, the child should have that accurate biological knowledge which comes through a study of plant and animal life. This he will obtain from agriculture and natural sciences.

The teacher should have a knowledge of the science of education, since health is now recognized as one of the major aspects of education in general. Physical, mental, emotional, and social health determine the quality of all education. The teacher should know the principles of teaching, since health education is based on modern child psychology. He should possess a knowledge of subject matter from the basic sciences which will provide him with scientific and technical information relative to health. Courses in the study of sociology, psychology, biology, bacteriology, physiology, anatomy, nutrition, hygiene, and sanitation should be part of his professional preparation. The information gained from the study of these subjects will provide a scientific and technical approach to the entire programme of health education. This preparation will aid him in providing conditions and opportunities for healthful school living. It will be a guide in the integration of health with the entire school programme. The needs and capacities of the individual child, the daily health supervision of the children, the contribution of special health



services, measures for the control and prevention of communicable diseases—all these will have greater significance if the teacher has such scientific preparation.

**Relation of the Teacher to Health Services.** Since the teacher is with the children in the class-room throughout the day, he is the most important person connected with health services in the school. If informed and alert he will detect in the child deviation from normal health, and can enlist the co-operation of the parents in the prevention and control of communicable disease. He will also be able to interest the parents in remedial treatment of physical, mental, and emotional deficiencies.

The responsibility for health service in the school rests primarily with the class-room teacher. Even where the professional services of a doctor, a nurse, or a dentist have been provided the responsibility of the teacher still remains. Where these special services are not provided the teacher will discover by careful observation and periodic inspection the more or less obvious health needs of the individual child. From day to day the health behaviour of all pupils should be observed. Simple records of these observations should be made and retained for reference. These records should include notes on vision and hearing difficulties, susceptibility to frequent colds, stomach disorders, chronic listlessness or weariness, lack of interest in games and play activities, inability to play happily and to co-operate with other children, sulki-ness, temper outbursts, and other recurrent emotional disturbances.

The teacher should understand the reasons for all measures relating to the prevention and control of communicable diseases. He should be familiar with procedures governing the exclusion and readmission of pupils upon order of the Medical Officer of Health. Quarantine, vaccination, and immunization should be explained to the pupils and to their parents by the teacher. This explanation should emphasize the protective and preventive aspects rather than that of the personal discomfort involved.

School health services, including medical, nursing, and dental departments, are provided in many urban communities and in an increasing number of rural areas. In a school where these services are available the teacher should make himself familiar with the work which each service is doing for the child and for the community as a whole. The teacher is the connecting link between the child, the home, and the community on the one hand, and the doctor, the nurse, and the dentist on the other. He should at all times explain to the child and to his parents the work of the doctor, the nurse, and the dentist.

Before an examination by any member of the professional services, the teacher should explain to the child the reason for such examination and the manner in which it is to be conducted. The examination then becomes a worth-while experience involving elements of interest and learning. By mani-



festing an attitude of confidence towards the school health services at all times, the teacher will contribute much towards inculcating similar attitudes on the part of the children and their parents. The record of observations made by the teacher through daily contact with the children will be of great value to the doctor, the nurse, and the dentist, and should be available to them as a confidential report when they visit the school.

It is desirable that the parent be present at the medical examination of the child. But where this is not possible the teacher will oftentimes be able to bring to the attention of the parents the results of the examination and enlist their co-operation in having remedial measures effected. If possible, the teacher himself should be present at the examination. He should receive from the examining physician and the nurse a summarized statement of the health status of each child. This statement should not be technical in character but should be given in such terms as will afford clear guidance to the teacher in directing the subsequent activities of the child. For instance, it may be found that certain children should have increased rest periods; some should be relieved from types of work which require continuous application; and others should not attend school for the full day, or, if in attendance, should be given relaxation periods out-of-doors. Participation in physical activities should at all times be in accordance with the recommendations of the professional services.

The school doctor, the dentist, and the nurse must work in harmony with the teacher since the promotion of the health of the child and the provision of healthful school conditions depend upon the close co-operation of the teaching staff and the personnel of the professional services.

## CHAPTER V

### THE HEALTH OF THE TEACHER

Any handbook on health education must recognize the importance of the teacher's own personal health. This has two aspects—the health of the teacher as it affects his personal efficiency and the health of the teacher as it affects the physical, mental, emotional, and social health of the pupils.

**Factors Affecting the Health of the Teacher.** Certain environmental factors in the school have a direct influence upon the health of the teacher. Studies of ventilation made in a large school system demonstrated the fact that where the teachers controlled the ventilation so as to provide cool, moving air and regulated the temperature within the limits of from 68° to 70° F. the yearly loss of time due to colds was reduced from five days to less than one day. The importance of adequate lighting and the possibility of strain on the teacher's eyes resulting from windows improperly placed should be understood by the teacher, who should so plan the activities in the class-room that he may move about without being forced to face the light.

Overcrowded classes place a strain upon the teacher who seeks to give the best type of education. The regulations of the Department of Education state that there should not be more than thirty pupils for each teacher in a kindergarten-primary room, and not more than an average of forty in each of the class-rooms from Grade I to Grade VIII.

A teachers' room is a necessity in maintaining the health of the teaching staff. As far as possible it should be used as a modern professional club-room. The location should be such as to ensure quiet for the teachers, and the furnishings should provide facilities for rest.

The highly organized system of supervision which obtains in some centres adversely affects the health of certain teachers. The responsibility for education rests primarily upon the class-room teacher, and the greatest contribution of the administrative and supervisory staffs will come from encouragement and help, through conference, discussion, and consultation. There are wide variations in ability, personal characteristics, and temperament among teachers. By administrative and supervisory officials the teacher must at all times be considered as an individual. In determining the grade to which any teacher will be assigned, his personal qualifications to deal with children of specific ages should receive consideration. There are many ways of teaching and the teacher should have the opportunity of analysing his methods and procedures in consultation with the supervisory staff. The latter should encourage initiative, responsibility, and independence. School authorities are coming more and



more to an appreciation of the fact that the teacher can do his best work only when he is best fitted for his task and when conditions are provided to enable him to maintain himself at his best physically, mentally, emotionally, and socially.

Teachers in increasing numbers are recognizing the importance of scientific knowledge relating to personal and community health. The value of a yearly appraisal of the teacher's own health status cannot be overestimated. Where medical, dental, and nursing services have been provided for the pupils it is reasonable to expect that these be made available also to the teachers. Many business firms have adopted the practice of supplying this type of service to employees. The number of firms maintaining such departments is steadily increasing, showing that employees appreciate and use the services. Teachers who seek to secure a perfect personal attendance record overlook the fact that when they go to school with health below normal they appear at a disadvantage before the pupils. Disciplinary problems in the class-room which may result in misunderstandings with the home are often due to the teacher's failure to realize the importance of maintaining his optimum health as a requisite for efficient teaching. A teacher may have personal health handicaps. If he is aware of these and has worked out a mode of life in keeping with such limitations there may be little impairment in his teaching efficiency. The teacher who refuses to recognize such handicaps and takes no measures to live within the limits prescribed by them oftentimes presents a real problem to the administrative staff. The teacher has, therefore, very sound personal reasons for giving due consideration to the maintenance of his own health.

Under regulations of the Department of Education, the teacher is entitled to a period of sick leave not exceeding twenty days in any one year. This provision is generous, and was instituted to protect the teacher and to aid him in the maintenance of his health. At the present time there are available well-qualified teachers for supply work. A supply teacher will be able to do better work in the class-room than the regular teacher who is temporarily indisposed.

**Personal Health.** Teachers are beginning to take an intelligent interest in the preservation of their own health. There are several important reasons for this. Teachers, like other people, realize that any degree of wholesome satisfaction in living depends directly on the maintenance of reasonably good health, and teachers, even more than other people, need to learn how to keep in good physical condition.

This is not because their work entails any special hazards to health. Compared with other professional groups, teachers are found to have a somewhat longer life expectancy and a slightly lower rate for severe and protracted illnesses. Yet it is true that teachers contribute rather more than their share to the number of persons who are either wholly incapacitated or who are rendered ineffective by minor illnesses of a preventable nature. The frequency of colds



and other respiratory infections among teachers and the number who are incapacitated as a result of the so-called "nervous breakdown" indicate the extent to which poor health prevails among them.

It would appear that in many cases of serious illness the causes are deep-rooted and have had their inception long before the individual teacher entered the profession. Suitable selection should be made of those who purpose to enter this work, since persons who are physically, mentally, or emotionally handicapped find it difficult to face the problems of the class-room without strain. The result is that they often break down and the blame is placed upon the work of teaching rather than upon those personal conditions which existed before the prospective teacher began his training in the Normal School.

The teacher's health is not just his own personal affair. In our modern world the preservation of health has become an important social obligation. It is obvious that people with typhoid fever or diphtheria cannot be permitted to regard their illness as a matter of purely private concern. Yet it is not by reason of the presence of such diseases only that individuals may become a menace to the health of the social group in which they live. Since the maintenance of physical, mental, and emotional health depends very largely on the development of certain habits of living, and since these habits, whether good or bad, tend to become established in any group in which they are practised, the health of the individual has important social ramifications.

This is particularly true of teachers. The health of the teacher exercises a definite influence on the health of his pupils. Careful and detailed observations have been made of the health of groups of pupils over a period of years as they pass from teacher to teacher in a graded school. The records of such classes show in graphic fashion how the health of the class as a whole improves or deteriorates according to the health of the teacher.

There are also professional reasons why good health is essential to the teacher. It is impossible to be a good teacher and a sick teacher at the same time. It is a mistaken idea that the teacher can serve the best interests of his pupils by neglecting his own health. It can never, in any circumstances, be in the interests of pupils.

It is evident that teachers must maintain a high level of sound personal health if they are to experience satisfaction in living, if they are to be desirable members of the social group in which they live, and if they are to be efficient members of the profession.

If teachers are not generally noted for their good personal health it is not usually because they fail to be concerned about it. Fear, anxiety, and worry over health must be recognized as some of the most harmful practices in which any of us can indulge. Worry is a somewhat enjoyable form of self-indulgence. It is a substitute satisfaction when one continues to worry instead of doing something about the source of worry. Instead of taking active steps to remove the causes of poor health, many people seem to prefer discussing

the subject with their friends and associates. They seem to find that this is the only way they can enlist sympathy and attention from those about them. That acting like a martyr brings considerable satisfaction cannot be denied. That it is not a healthful habit should be clearly recognized.

When something goes wrong with a car the owner is wise enough to secure expert advice. He does not think of trying to repair the mechanism himself. The mechanism of the human body is far more delicate than that of a motor-car, yet there are many people who, instead of consulting a competent physician when they are not feeling well, show no hesitation in tinkering ignorantly with self-remedies and alleged cures until the trouble has been unnecessarily intensified and the problem of intelligent treatment made vastly more difficult.

The habit of securing competent advice as soon as there is any indication of poor physical, mental, or emotional health is one of the first and most important habits in the interests of personal health. This will be found a most effective antidote for worry.

One contributing cause of illness among teachers is neglect to plan and carry out a scheme of healthful living. Teachers would be well-advised to give adequate attention to the regular practice of those simple habits upon which general physical health is based. The importance of developing regular habits of personal hygiene, including sleep and rest, exercise and food, external and internal cleanliness is well-known, but the actual practice of these habits is not so common. Teachers are apt to overlook the importance of a regular daily schedule which includes exercise, rest, and food in proper quantity and of suitable quality to ensure the efficient functioning of the body. Although such habits appear to be related primarily to physical health, it happens that they also contribute to the development of good mental and emotional health. Living conditions affect all aspects of one's health. The teacher should, therefore, select living accommodation that will enable him to build up the best possible physical, mental, emotional, and social life. His manner of living in the community should represent the best standards of decent living and refined taste.

Progress in the medical sciences has brought to us a great wealth of information concerning the habits which are important for the maintenance of physical health. The habits necessary for the maintenance of mental and emotional health are equally simple and equally important. Since these aspects of health have not as yet received the attention they deserve, special emphasis should be given to the mental and emotional habits conducive to health.

There is nothing obscure or mysterious about mental health. To understand the general principles underlying mental health a person need not be a psychiatric expert. There is no need to be morbid or unduly introspective. There is no reason for becoming depressed or anxious. All that is necessary



is for a person to study himself honestly, to evaluate his condition, and to take constructive action.

The important factors in preserving mental health are largely under one's own control. A common method of evasion is to blame poor mental health on environment. Teachers often try to excuse their "nervousness" and poor emotional control by laying the blame upon the difficulties under which they teach, and the special strain which teaching is supposed to involve. Others prefer to blame their grandparents and complain or boast that they have inherited an exceptionally sensitive and nervous disposition. These excuses should be recognized for what they are—simply evasions. The individual refuses to face facts. The important factors determining mental health are actually under one's own control. They are not controlled by one's environment or by other people.

Health is dependent on the development of desirable habits. The extent to which these habits have become part of everyday behaviour is a measure of the present health of the individual. Health is constantly changing, either deteriorating or improving; it is never static. It cannot be achieved once and for all. So long as life lasts the individual must strive to maintain his capacity for adaptive effort.

It is important to remember that health is a matter of degree. No one is in perfect mental health, just as no one is in perfect physical health. A careful physical or mental examination will always reveal conditions which could be improved. The teacher who has the understanding and the insight to see that he is not in perfect mental or emotional health has no need to be alarmed. There are certain definite steps which he can and should take. In the first place, he should look for the source of the difficulty. He may need help in finding the underlying cause. This help may be gained from a person in whose knowledge and judgment he has confidence. Consultation with a person possessing special training may be advisable. Once the cause has been found, the next step is to reorganize his programme of living and substitute desirable for undesirable habits.

In an effort to indicate the lines along which a teacher may improve his mental and emotional health, certain habits will be discussed briefly. Happiness is a by-product of healthful living. The habit of being moderately happy is an indication of good mental and emotional health. Persistent unhappiness is a symptom of poor mental health. It shows that there are difficulties which are not being solved. The teacher who is chronically unhappy will accomplish nothing by trying to persuade himself that the unhappiness does not exist. Such a practice is childish and unhealthful. Occasional periods of unhappiness, some causes of which are beyond our control, are common to us all, irrespective of our state of health. Chronic unhappiness, however, is neither inevitable nor healthful and calls for constructive action in determining and removing the cause.



Narrow mental vision is detrimental to the development of good mental and emotional health. Owing to the dominant position which the teacher holds there is special danger of his losing perspective, paying excessive attention to minor virtues, maintaining petty standards of deportment, and becoming righteously indignant when these standards are disregarded.

A person may take pride in his narrow-mindedness without realizing that he is narrow-minded. He seeks to elevate local customs and petty taboos to the level of universal laws. The teacher who lets himself be swamped by a multiplicity of tests, drills, reviews, detentions, record forms and reports, who spends his waking time in being a teacher and nothing else, cannot avoid having a narrow outlook. Those who have travelled widely find it very difficult to remain narrow in outlook. They discover that, beyond the boundaries of their own immediate locality, people have other standards, other values, other systems, and other ways of living. Their perspective is broadened to the point of understanding and tolerance. The teacher who cannot travel widely can at least make sure that his outlook is not completely limited to the four walls of a class-room.

In a recent investigation a large group of mentally and emotionally healthy teachers was compared with another equally large group of mentally and emotionally unhealthy teachers. One of the most striking differences between these two groups was found to be that the teachers in good health had much broader social interests, and had a larger number of hobbies which took them entirely away from the school and its atmosphere. Limitation of interest begets a very serious limitation to health. The teacher should arrange to get away entirely for part of each day from the atmosphere of the school.

One symptom of narrow-mindedness is extreme orderliness and regimentation in the class-room. Regimentation by the teacher will produce pupils who behave like good little soldiers, quiet, obedient, cowed, and passive, while the sergeant-major at the front of the room gives commands. There are, fortunately, few class-rooms in which perfect regimentation is achieved. Most children are natural and healthy enough to rebel against an artificial set of values. There are, however, teachers who imagine that strict regimentation is desirable as an evidence of discipline. The cause of this regimentation is frequently shown upon analysis to be traceable to poor health or to lack of ability. The teacher who has failed as a teacher may be satisfied to be a drill-master, but such discipline is a poor substitute for good teaching.

Another indication of lack of perspective is the emphasis placed by the teacher on the importance of marks, grades, and class standings based on competitive examinations. Parents are sometimes worse offenders than the teacher in this respect. Nevertheless, the teacher cannot escape the responsibility of breaking down the mistaken notion that high standing in school work and rapid academic progress are the most important things in a child's life.

In the interests of the personal health of the teacher, it is of the utmost

importance that he should spend a considerable portion of his time in the society of people whose sense of values has not been determined by a purely academic atmosphere.

Those who have made a careful study of mental health and mental illness have come to the conclusion that the habit of making decisions promptly contributes to good mental health. Contrary to what is often taught, prolonged and laborious deliberation over what one is going to do seldom contributes to success. The state of chronic indecision is not only very distressing but it actually leads to inefficiency. An excessive degree of caution is detrimental to the maintenance of mental and emotional health. Those who hesitate to make decisions because of a fear of consequences should remember that there are very few decisions which are irrevocable and of which any undesirable consequences cannot be repaired.

Indecision, hesitancy, and vacillation in front of a class tend to weaken the efficiency of the teacher. Inability to make up one's mind is a definitely unpleasant experience. Continuous refusal to face facts and to make decisions leads to chronic indecision. In developing the healthful habit of dealing with issues decisively it is not necessary to become domineering. It is, however, necessary that one be candid enough to admit the making of occasional mistakes. The teacher who insists that he is always right cannot afford to be decisive, but the teacher who is chronically indecisive reveals a weakness and inadequacy of which pupils are not slow to take advantage.

The teacher who spends much of his time thinking dreamily in the past, or planning dreamily for the future, cannot be a good teacher in the present. It may be desirable to take an occasional glance at the past or at the future. If a person is to be efficient and healthy he should learn to live in the present. He should guard against the tendency to glory in past successes. He should also guard against depression over past failures. Nor should hypothetical dangers or imaginary achievements of the future claim the major portion of his interest. One should learn to live in what Osler called "day-tight compartments."



## CHAPTER VI

### THE INDIVIDUAL CHILD

More and more does the progressive teacher appreciate the importance of the physical, mental, emotional, and social capabilities and limitations of the individual pupils under his care. The teacher should be familiar with the social background and the emotional environment of the child and the attitude of his home toward health. Such individual characteristics as cheerfulness, perseverance, self-consciousness, timidity, truthfulness, temper control, ability to get along with others—all influence the child's academic progress. Of equal importance are the child's physical endowment and his ability to attend school regularly, to hear and see clearly, to participate fully in the ordinary physical activities associated with school attendance, and to profit by his school opportunities.

Many educational objectives and procedures are based on the assumption that all children who attend school are born physically and mentally equal and, under similar educational treatment, are capable of attaining uniform standards of achievement. More or less arbitrary measurements of progress have been set up. The child who is academically inclined and the direct learning child, the physically fit and the physically handicapped child, the child with a rich social background and the child with meagre social opportunities—all are expected to reach the same levels of attainment.

The inevitable result has been rigidity and inflexibility of the school programme. There has been over-emphasis on arbitrary academic standards. The neglect or inadequate consideration given to the physical, emotional, and social development of the individual child has resulted in the adoption of class-room procedures which too frequently are inelastic and ineffective in developing a well-balanced personality. The aim of the school should be not standardization of the child but rather his natural development. School activities should be varied so that every child will have an opportunity to explore his capabilities, to discover his limitations, and to find through the integration of his individual experience patterns of living which will bring him satisfaction and resultant happiness.

Schools are recognizing the need for a flexible programme related to the mental and physical life of the child. Special consideration has been given those children who display deviation from the so-called normal types of learning. Provision is also made for children with physical handicaps. The significance of individual differences in the emotional and social equipment of children should have increasing influence on the organization and procedures of the school.



Emotionally the child possesses certain needs. A knowledge of these will determine the organization of the class-room. The child needs affection. This must be sympathetic but not sentimental, constructive but not unduly protective. It should help the child to discover his own potentialities.

The child craves activity. This activity must be purposeful, worth while to the child, and must bring to him a feeling of adventure. He must be more than a cog in a class-room machine, and he should derive from his work that joy which is the basis of æsthetic creativeness. The child should experience those feelings of satisfaction which are the outcome of successful effort. The memories of successes, however slight, will give him confidence which will assist him in his social adjustments.

The child must have a feeling of security and adequacy. This feeling is more important than any academic equipment which the school can give. Possessing it, he will meet without emotional disturbances the vicissitudes of a changing social, economic, and moral environment.

The physical, mental, emotional, and social growth of the child presents to him many difficulties. That these difficulties are very real and that the child's attempts to solve them are of great significance should be recognized by the teacher. The child must be given sympathetic understanding and intelligent guidance if he is to solve the difficulties he meets from day to day.

There is close relationship between physical growth and mental and social growth. A child who, because of certain physical limitations, cannot take his part in the activities of children of his own age must learn to adjust himself without emotional disturbance. The teacher should make an effort to understand the difficulties which confront each child and should help him to face them without evasion or withdrawal. This help will come through intelligent guidance. There should never be left with him anything that would cause reflective anxiety. The problems connected with growth will vary at the various age levels. The child should be aided to understand his own problems and to work out his own solutions. He will profit from his own decisions and solutions much more than from those of others.

The teacher should recognize among children those individual differences which grow out of their social backgrounds. Every child must learn to adjust himself to other people, to the school community, to authority, to children of the other sex, and to his own capabilities and limitations. Since children come from homes of many types, homes in which the parents are of various social levels and display a multiplicity of attitudes towards society and social institutions, it is obvious that the process of education for social health is a matter of individualized effort.

The teacher should maintain an attitude of detachment towards the child. This will enable him to regard the individual child in the proper perspective. Because of his day-to-day contact with the child, he has a better opportunity of observing the child's health behaviour than have the parents or the doctor.

The teacher is in a position to observe and note if the child presents the slightest deviation from his normal health.

All cases of children who breathe through the mouth, who squint, who strain to see the blackboard, or who bend low over their desk work or hold books too close to their eyes, or who do not hear what is going on in the class-room, will be noted by the intelligent teacher. He will not characterize these children as dull or lazy but will make every effort to have conditions remedied, and will adapt his class-room procedures to meet their needs.

Observation of the child in his associations with other children will also help the teacher to discover certain symptoms which affect the child's mental health. Some children show excessive timidity when asked to perform certain activities before the class; others become unduly disturbed when given new work requiring responses other than habitual. Irritability, unsocial conduct towards others, exaggerated aggressiveness, excessive selfishness—all these are symptoms which should be noted carefully by the teacher. These symptoms are not problems in discipline requiring punishment but to the discerning and informed teacher they present an opportunity to serve the child by leading him to work out adjustments which will increase his happiness both during his school years and in later life.

The teacher should avoid undue stressing of so-called health rules and the use of such meaningless phrases as "regularity of health habits," "health conscious," etc. There should be no attempt to force the formation of health habits. With the child's developing maturity these should emerge naturally from his daily practices, and if they are not forced there is greater likelihood that they will become established and will be carried over into adult life.

The child should never be given the impression that he is sub-normal, handicapped, super-normal, superior, or in any way different from others. The teacher who can help the pupil to grow up without becoming self-conscious of his growth is giving him the best type of health education.

To obtain the necessary knowledge regarding the capabilities and limitations of the individual child the teacher should make a survey of the children in his room as early as possible after the opening of school in September. This survey should reveal the health status, the health practices, and the social and home background of each child.



## CHAPTER VII

### HEALTH SERVICES IN THE SCHOOL

Health services were first introduced as part of the school organization in Ontario in 1908, and by 1912 they were established in all of the cities and in most of the other larger urban centres. The control of communicable disease was the original purpose of these services, but their scope has been gradually extended and to-day they include also the discovery of defects and the promotion of their correction; supervision of the sanitation of the school plant; and an interest in the establishment of satisfactory health practices by the children.

Professional health service in the school is carried on sometimes by a physician working alone, sometimes by a nurse working alone, or by a physician and a nurse and a dentist working together. In some centres a psychologist and psychometrist are included on the school health staff. Whatever the personnel, however, the professional health services should function in accordance with the principle that the well-being of the individual child is the first and most important concern. Members of these services must rely on the class-room teacher for that co-operative support which is so essential to the success of any effort affecting the children under his care. A maximum health service to the individual child and to the school group as a whole will be effected where members of the professional health services are regarded as an integral part of the school staff and meet in regular conference under the direction of the principal.

**Medical Service.** The physician gives his first attention to the control of communicable disease among the children. He emphasizes the value of prevention and arouses public interest in immunization against diphtheria and smallpox. He refers to the local Medical Officer of Health for segregation those children found to be suffering from various diseases which are spread from child to child.

The school physician is also responsible for the medical examination of all children in attendance. This examination possesses important learning values for the children, which will be effective when closely related to other health activities of the school. Any instruction by the school physician is personal and is given at the time of the examination. During the interview with the school physician, the child's attention is centred on his own health problems and he will desire information with respect to these. The physician has thus an opportunity to build up favourable attitudes regarding health and



the importance of regular medical supervision. These should have carry-over values into adult life.

Before a medical examination is given, the consent of the parent is necessary. The parent is often invited to be present at the examination. The physician takes advantage of the parent's presence to discuss problems concerning the child's health and to secure an accurate history of the child, including information relating to illness and health practices. A discussion with the physician will give the parent an understanding of the child's health status and health needs and will secure in many cases his co-operation in effecting correction of remediable defects.

It is important that the teacher instruct the children prior to the examination by the physician so that they will understand the significance of the examination in its relation to their own personal health. This preliminary preparation will afford an opportunity of removing fear of the physician from the mind of the child.

While in some centres an effort is made to give each child a medical examination once a year, in the majority of cases the practice is to give each child two complete examinations while he is in the elementary school. The first of these examinations is given when the child enters school; the second in his final years. This, however, does not preclude additional examination of any child who, in the opinion of the parent, nurse, or teacher, appears to need it.

Examination during May and June of those children who will enter school in September is a plan in effect in some centres and appears to have considerable merit.

The school physician should be called in case of emergency. He should give direction to any plan of instruction in first-aid and resuscitation. He should also supplement the instruction of the teacher with respect to the control of communicable disease.

When the parent is financially able to engage the services of a physician the matter of treatment should present no problem. The school medical officer, the nurse, and the teacher should assume the responsibility of convincing the parent who is able but unwilling to spend money on necessary treatment that such treatment is in the best interest of the child's health and subsequent well-being. Difficulties arising from inability of the parents to pay may be met in various ways. Some municipalities use the clinic services of the hospitals, the latter being subsidized for giving this service. When municipal funds for remedial treatment of children are not available the local medical society has on occasion co-operated in making limited treatment possible.

Voluntary agencies in some communities have assumed responsibility for remedial treatment. The problem varies with the community, but the professional health services and the teaching and school administrative staffs can do much to secure help for those children who need it by influencing public

opinion through the presentation of factual material in an effective way, at opportune times, and through acceptable media.

**Dental Service.** No plan of health service for the school child is complete without dental service. Like the medical examination, the dental examination, whether conducted in the private office or in the school clinic, holds an important place in the health education of the child. The teacher should make the child's visit to the dentist an opportunity for valuable learning experiences related to his personal health problems.

Essential points in school dental service are: the emergency relief of pain; dental examination; supervision and preventive treatment; and consultative service to teachers.

To be effective, a dental examination should be given once a year. Any instruction given by the dentist should be personal and should be given to the individual child at the time of the examination. At such a time the child's attention is centred on problems relating to his teeth and, during his interview with the school dentist, he should be encouraged to seek information regarding their care. The dentist should take advantage of the opportunity to create in the mind of the child favourable attitudes with respect to mouth hygiene and regular dental supervision. These should have carry-over values into adult life. Arrangements are made whereby the class-room teacher receives from the dentist a simple statement of the child's dental needs.

All dental treatments may be considered to have preventive values. In order of importance these are: elimination of infection; attention to carious teeth and pre-carious pits and fissures; prophylaxis; and orthodontia. The problem of ensuring adequate dental treatment for all children presents certain difficulties. For the child whose parents are unable to pay, funds are often available through official or through voluntary agencies. Those parents who are financially able to provide dental treatment but are unwilling to do so present a real challenge to the dentist, the nurse, and the teacher.

The local dental society is always willing to assist in the organization of an acceptable plan of dental treatment. The plan will vary with the community, but the dentist, the nurse, the teaching and school administrative staffs can do much to secure treatment for those children who require it by influencing public opinion through the presentation of factual material in an effective way, at opportune times, and through acceptable media.

Since the dentist is the recognized authority on matters pertaining to mouth health he can, through consultative service to the teacher, contribute much to the dental health education of the school. The teacher should have opportunity to consult with the dentist on problems pertaining to the mouth hygiene of any individual child.

**Nursing Service.** There are clearly defined professional duties of the school nurse, the scope of which should be appreciated by the teacher. The



nurse also should assist the teacher in securing factual information and in checking the scientific accuracy of material for health instruction. She should be available in case of emergency. She should give direction to any plan of instruction in home nursing and child care and should, when requested, supplement the instruction of the teacher regarding the control of communicable disease. She should be ready to discuss problems affecting the personal health of the teacher and of any individual child. She will also be of assistance to the teacher in supplying information regarding the professional services available from all public and voluntary health agencies.

Her contribution to the broader concept of health teaching, while probably less specific than that made by other members of the professional group, is none the less considerable. Her regular contact with both teacher and pupil should influence favourably the effective functioning of a desirable programme.

**Teacher Service.** The responsibility for health service rests primarily with the class-room teacher. Professional health service by the physician, the nurse, and the dentist will be supplementary to that of the teacher. The teacher retains responsibility for daily health and cleanliness appraisal; for the observation of the individual child's physical, mental, emotional, and social health; and for the exclusion and re-admission of children.

The daily health and cleanliness appraisal should not be standardized nor should it become mere routine; nor should any responsibility for any part of this be assigned to any child in the school. If it is to be informative, the teacher must at all times recognize its importance. It will vary with the community, with the class, and with the age and needs of the individual child. Emergencies and epidemics will modify the appraisal by the teacher. At all times the teacher should observe the child both at work and at play, alone and in association with others, and should record any deviation from normal behaviour.

It is the duty of the principal to exclude a pupil from school when deemed necessary. The full support of the teaching and administrative staffs should be extended to the health authorities in the control of contagion. The matter of excluding and of re-admitting children for reasons pertaining to health is covered by the regulations. These regulations are cited in Chapter XXVIII.

The teacher should weigh and measure the child periodically as an activity in health education. This procedure will arouse and sustain the child's interest in his growth and health. The child's gain in weight and height are indicative of his health status. The teacher should report to the parent without comment when a child is losing weight or when his weight remains stationary for any prolonged period. If in a school where nursing service is provided, the teacher should discuss the matter with the nurse.

For measuring weight a set of accurate scales is necessary. The teacher of the junior grades may record the children's weights on a class-room



record chart. The use of such charts is discontinued at the end of Grade IV. The child should be encouraged to record his weight in a health note-book. Interest is sustained if weighing is carried on systematically. It is recommended that children in all grades be weighed once a month. In order to make an accurate estimate of the child's gain, it is necessary to weigh him at the same hour on the same day each month, and to ensure that his clothing is of approximately the same weight. In order to ascertain his actual weight as closely as possible, the child should remove heavy wraps and overshoes and stand evenly balanced on the scales. The child's weight should be read to the nearest half-pound.

The equipment for measuring height is a marker and a measured strip of sufficient length to measure the tallest child in the school. Pupils in a number of schools have made measuring equipment which can be carried from room to room. It consists of a rod fitted with a sliding marker and built on a solid base. In many schools a section of the class-room wall free from a protruding base board has been used, with a chalk box as a marker.

The teacher of the junior grades may record the children's heights on a class-room record chart. The use of such charts is discontinued at the end of Grade IV. The child should be encouraged to keep records of his height in a health note-book.

In order to ascertain height as accurately as possible, the background should be uniformly flat; the child should stand with his head, shoulders, and heels touching the background and the marker should be flat on the top of the child's head and also flat against the measure. Height to the nearest half-inch should be read. Measuring need not be done more frequently than three times during the school year.

Where professional health services are provided in the school, the teacher will have a trained personnel with whom he may consult concerning all problems relating to health. The teacher has a very real contribution to make to the professional health services. He can supply a record of the child's attendance at school, together with explanation of absences; he can submit his findings and observations of the child's physical, mental, emotional, and social health while at work and at play; through preparation of the child he can increase the value of the examinations by the physician or the dentist and of the inspection by the nurse. He will assume responsibility for sending to the parent notification of all health examinations of the child and should urge the parent to be present at all examinations, when such attendance is desired. If in the school at the time, the school medical officer or the nurse should be consulted before excluding a pupil for reasons pertaining to health. In any case, they should be notified of the action taken.

Where professional services are not provided the teacher must assume a greater responsibility. This will include the daily health and cleanliness appraisal of all children; exclusion and re-admission of children for reasons

pertaining to health; and the observation of the health behaviour of the individual child. In addition, he should test the vision and hearing of all children. He will make no attempt at a diagnosis nor will he suggest treatment, but he should report to the parent that there would appear to be a deviation from normal condition, when such is found. He should follow up his report by trying to induce the parent to secure professional attention for the child.

The general appearance of the child may often be indicative of his health. The teacher will note his colour and whether there is flushing or an unusual pallor; his posture and whether it seems to be connected with persistent fatigue; his gait; also whether he suffers from: chronic nasal discharges; frequent nose-bleeds; nasal obstruction resulting in mouth-breathing; frequent headaches; thumb-sucking; nail-biting; frequent colds; stomach disorders; chronic listlessness or weariness; lack of interest in games and play activities; inability to play happily with other children; sulkiness and outbursts of temper.

The teacher should observe the inside of the child's mouth, noting such defects as: decayed primary teeth; any roots or broken pieces of primary teeth which may be wedged between the secondary teeth; decayed secondary teeth, particularly the first four; any abnormal appearance of the gums; irregular teeth; stains, tartar, and discoloration or other evidence of neglect of the teeth and gums.

The teacher should know that any hearing defect presents a serious handicap to the child in school and may become a permanent handicap in adult life. He should, therefore, note any of the following deviations with respect to hearing and the ear: dullness of hearing with resultant inattention and restlessness; bewildered expression and turning of the head in an attempt to hear; ear-ache; and discharge from the ear. To assist the teacher, some schools have arranged for the use of an audiometer to test the hearing of the pupils. If this is not available and the teacher has no means of securing professional help he should test the hearing of the pupils himself.

Hearing is considered normal when ordinary conversation is heard without effort at a distance of twenty feet. Ordinary conversation is difficult to define and does not constitute an absolute measure; the closest measure is that of the teacher's normal voice. The teacher should observe the following conditions for testing the hearing of any child. The room should be quiet. The child should be asked to stand with his back to the teacher at a point twenty feet distant. Single words familiar to the child are spoken by the teacher. As each word is spoken it is repeated by the child. Because sibilant sounds carry more readily than others, words containing them are not used in the tests. At least five words should be used for each test. It may be necessary to repeat these tests for certain children.

The tests are made, first, of both ears together, and then of each ear separately. In order to secure a reliable result, hearing in the left ear should



be entirely cut off while the right is being tested. This may be done by firmly pressing the fleshy part of the palm against the opening to the left ear. The teacher should check the effectiveness of this method with each child before giving the test. In the same way the left ear will be tested while hearing in the right ear is cut off.

The teacher should repeat the tests in the case of any child who seems to show deviation from normal hearing. It should be borne in mind that certain children become nervous, fatigued, or confused when first given a hearing test. These children should receive special consideration.

If, after repeated tests, the teacher is convinced that a child is having difficulty in hearing, a report should be made to the parents, who should be urged to consult a physician. Delay and postponement of treatment of hearing defects may lead to a permanent and total disability.

During the morning health appraisal of the pupils and in the observation of the child throughout the school day the teacher will note the following as indicating vision difficulties or undesirable eye conditions: blinking; squinting; frowning; signs of so-called crossing of the eyes; inability to distinguish colours; holding books or other materials too close to or too far from the eyes; redness of the eyes; granulation of the eyelids; headaches; and digestive disturbances.

The parent should be advised where any of these conditions are noted so that the child may receive professional attention. Any vision defect is a serious handicap to the child in his school work and, if not looked after, may result in a serious, permanent handicap.

Normal vision means that the eyes and all tissues connected with their use are so constructed and functioning as to give a true perception of light, colour, form, and depth.

The class-room teacher may use a standardized test for detecting short-sightedness. He should bear in mind, however, that the use of this concerns only one aspect of vision. The test is based upon a chart which may be secured by any teacher.<sup>1</sup> Full instruction for use is given with the chart.

The teacher should understand the significance of the results of the standardized tests for short-sightedness. A child should be able to read the twenty-foot line with both eyes, and with each eye separately. If he can read the twenty-foot line with one eye but can read only the thirty-foot line with the other, his vision should be tested again within the year. If he can read the twenty-foot line with one eye but can only read the forty-foot line, or those above it, with the other eye, he should be given several additional tests to check the findings; if these re-tests show vision disability, the attention of the parents should be called to the condition without delay. If the

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<sup>1</sup> James A. Cook & Son, Ltd., 42 Yonge Street, Toronto, and Canadian National Institute for the Blind, 186 Beverley Street, Toronto.



child can read only the thirty-foot line or those above it, with both eyes, or with either eye separately, he should be given several additional tests to check the findings. If these re-tests show vision disability, the attention of the parent should be called to the condition immediately.

The teacher should repeat the test in the case of any child who seems to show vision disability. It should be borne in mind that certain children become nervous, fatigued, or confused when given a vision test. Care should always be taken that the chart is properly placed and adequately illuminated. The illumination may be accurately measured by use of a light-meter.

## CHAPTER VIII

### PHYSICAL EDUCATION

Physical education is one of the most important concerns of the school. It contributes not only to the health of the child but has important influences on his emotional and social behaviour. It includes all those interests which are associated with physical activity, rest, and relaxation. Activities may be free, as in play, or directed, as in physical training.

Physical education should have an allotted place in school life and should be an integral part of the daily programme. It should be based upon those principles which are accepted as fundamental in all education. This means that it will be progressive and related to the developing needs and capabilities of the individual child. It will recognize individual limitations and differences. It will be broad and varied in its scope. It will offer to all children in the school opportunities for participation. Children who are precluded from group participation because of handicaps will be provided with a programme of activity suited to their needs. Physical education is related to anatomy, physiology, and pathology. It should not be based on empiricism, but should be scientifically accurate and in keeping with the most recent investigations of the scientist.

To be effective, any programme of physical education should be possible of application in all class-rooms and in all schools. It follows, therefore, that the responsibility for its direction must be in the hands of the class-room teacher. The programme should be presented in such way as to give pleasure and enjoyment to the child at the time and should enable him to develop skills, techniques, and attitudes which will be helpful to him outside of school and in adult life.

In the organization of physical education provision should be made to ensure the maximum benefit to each child, whether he is free from disabilities or whether he is suffering from some degree of emotional, mental, or physical handicap. The teacher, before undertaking to direct the physical education of his class, should consult with the school physician or nurse. They will be competent to advise on the eligibility of each child to participate in physical exercise, and they should suggest types of activity suited for special cases. If health services are not provided in the school, the teacher should consult with the parent before determining whether the child should undertake the full programme of physical activity or whether he should have a programme to meet his special needs.

Certain defects which interfere with participation in physical activity are capable of improvement and every effort should be made to secure the

maximum of treatment. If a condition has responded to remedial treatment, the teacher should make sure that the child is now participating in all of those activities within the limits of his increased powers. Parents, teachers, and associates should understand that a child may need re-education or special instruction in procedures and skills of those physical activities which he has forgotten or missed.

There are in every school children whose participation in the regular activities is difficult or impossible because of handicaps which are not capable of improvement or which have not as yet been subjected to treatment. The needs of these children should not be overlooked in the school's programme of physical education, nor should the children be forced to take part in activities beyond their capabilities. Non-inclusion of the child in physical activities seriously limits his self-confidence and self-respect. The handicapped child should be led to recognize his limitations and make those readjustments which will enable him to participate, so far as he is able, in the ordinary associations of play and other activities. Such participation will have a favourable influence on his health and personality. All ameliorative treatment must be based upon and follow the directions of the school medical services or the family physician. Special consideration should be shown to the child who returns to school after illness. He should not be expected to undertake immediately the full daily programme.

In every grade of the elementary school frequent periods of rest should be provided during the school day. These will vary according to the age of the child. Complete rest, in a recumbent position where possible, will be found valuable in the primary grades. Quiet periods of rest should be provided in the intermediate and senior grades. The child must be taught how to rest and there should be in every school opportunities and facilities for doing so.

The need for relaxation should be appreciated by the teacher. Periods requiring close mental application should alternate with periods devoted to hand-work. In industry and commerce it is now recognized that adults are capable of increased attention with resultant improved quality of work when periods of relaxation are provided during the working day. Where regularly arranged in the class-room, relaxation periods have resulted in improved attention and response of the children. Problems of fatigue and tension are physiological and psychological and should not be regarded as disciplinary. They occur in all grades and they should receive the intelligent consideration of the teacher.

The physiological value of exercise can best be described as increased cell activity. With any increase in the production of heat and energy comes an increase in the demand for oxygen, with a resultant rise in the respiratory rate. The heart's action is speeded up and the circulatory cycle is completed in appreciably less than normal time. There is an acceleration of the oxygen-laden blood to the active cells of the most remote parts of the body and a



quickened return of the blood with waste products. When a healthy person participates in well-directed physical activity carried on at regular intervals over a period of time there is a continuance of accelerated cell activity, with resultant increased demand for oxygen. Following this demand, there is a greater number of red blood-cells or oxygen-carriers in the blood stream, with a complementary rise in the amount of haemoglobin in the blood. Exercise properly carried out also increases the amount of air inhaled and exhaled, with consequent increased vital capacity. Fat and glycogen which the body has taken and stored from food are used up more rapidly during exercise. As a result of this, there is an improvement in appetite and in general nutrition. Exercise brings about an increase in the size of the individual muscle fibre, speeds up muscle response, and increases co-ordination and neuro-muscular skills. It must be borne in mind, however, that these desirable physiological results are brought about only when activity is not carried to the point of fatigue. For healthy body functioning rest is as essential as exercise.

Play offers opportunities for the child to participate in free physical activity which has both individual and social values. Play should not be regarded merely as amusement. To the child it is a way of learning and through it he adds to his growing funds of experience. In play the emphasis should be placed upon carefulness and security rather than on the dangers to be avoided. Increasing skill lessens potential dangers and successive achievements lead to further participation.

The child sometimes plays by himself and from this he receives as compensation increased efficiency. But sustained interest is in most cases possible only when play is shared with others. The group contacts of play are an education in social behaviour. Play affords opportunities for the child to learn how to get along with other children. He learns how to lead and how to follow. He learns that taking turns and sharing with others increase the happiness of the group of which he is a member.

Play is not instinctive. The child must be taught to play. Both the school and the home share the responsibility for the necessary instruction. The intelligent and informed teacher will appreciate the opportunity afforded in play for self-expression, initiative, and self-direction.

Physical training implies group movements by a number of participants at one time. It is designed to ensure desirable physical activity by all children in the class-room and requires little in the way of equipment. If it is to be beneficial it must be accompanied by a sense of enjoyment and must secure an eager, alert, and pleasurable response from the child.

Most, if not all, of our accepted team games are based upon those activities which are innate in children; namely, running, jumping, climbing, and throwing. In fact the popularity of the game is usually in direct ratio to the extent with which it combines these instinctive skills. The role of the

teacher in group games should be that of instructor and arbiter. It is inadvisable for him to be a participant.

To be effective, physical exercises should be taken at frequent and regular intervals, amid hygienic surroundings, and out-of-doors whenever the weather permits. The environment for indoor activities should always be sanitary. The floors should be clean; the windows should be open, and there should be a maximum amount of direct sunlight in the room.

Children should be encouraged to remove surplus clothing and where possible to wear suitable outfits and footwear for the physical training periods. To prevent chills, extra garments should be put on after exercise.

For protection and comfort children taking part in athletics and field games should be provided with special types of clothing. Provision should also be made for cleansing after strenuous physical exercises.

The carry-over value of the physical activity programme will depend upon the degree of pleasure associated with it and upon the attitudes towards keeping in good physical condition which the child develops. Physical exercises, rightly conducted, will provide the foundation for proficiency in field games and athletics.

Rhythms and dancing are recognized as important physical exercises. Even before entering school the young child is interested in rhythmic movements. From such movements, which are his physical response to simple music forms, he derives enjoyment and benefit. The school might rightly provide opportunities for the child to practise these rhythmic movements. They should not be standardized but rather the child should be encouraged to create his own forms of rhythmic expression in which he brings into play his powers of imagination and his ability to dramatize simple experiences.

In the intermediate and senior grades rhythms become definite and consciously organized dance forms. These will include individual and group movements. Original dance forms which will lead into dance composition should be encouraged. These should follow naturally from singing games and folk dances. The teacher should avoid any effort to attain adult standards in the performances of children. The enjoyment of the child, the variety and imaginativeness of the movements, and the relaxation which comes from spontaneous participation are primary and fundamental objectives.

The highly organized social and economic life of the present day has resulted in an increase of leisure. If this leisure is to contribute to the growth of personality and to a sense of social responsibility on the part of the individual, the school must assume some responsibility for instructing the child in the proper use of it. The child should be given a chance to explore wide areas of experience and to become efficient in varied forms of self-expression and creative activities which require skills and sustained effort and which will have carry-over values into adult life. Many of these he will find in play and in the physical and creative activities of the school.



Leisure interests are based on certain fundamental instincts, such as the desire for contact with nature and people; the desire for creation and self-expression; the desire for knowledge; and the desire to acquire things.

Under the first of these may be included such leisure activities as nature study, gardening, the care and training of animals, sports and games, photography, travel, and exploration.

The desire for creation and self-expression may find satisfaction in music, fine arts, dancing, architecture, drama, and handicrafts.

The desire to acquire knowledge may be satisfied in the fields of science, literature, history, and research.

The desire to acquire things is related to the collecting instinct. It may manifest itself in the collection and preservation of plant and animal forms, of books, pictures, stamps, coins, furniture, china, glass, and other objects.

The individual who has opportunities to experiment with hobbies and related activities acquires interests in life outside the routine of his vocation. He never tires of life, for each day brings to him new adventures in living. The refreshment which comes to him from such leisure activities enriches his own personality. In the pursuit of his hobbies, he is brought into contact with other people and his appreciation of social responsibility is enlarged. When given a proper place in the school, recreative physical activities contribute to an all-round development. They help the child to develop a rugged personality possessing self-dependence, poise, and repose.



## CHAPTER IX

### SELF-CONTROL: ALCOHOL AND TOBACCO

Self-control is not entirely a matter of negative restraint. It is rather the positive ability to direct one's present behaviour with a view to possible future consequences to one's self and to others. Self-control is important in the maintenance of health. A person's future health and well-being depend directly on whether his present behaviour is conducive to health and whether he has learned to check or restrain those forms of behaviour which may prove harmful to himself and to others. Self-control is a positive factor affecting the health of the individual.

The ability to control present behaviour in the light of probable consequences depends on a number of factors. One should know what these probable consequences are likely to be. Yet knowledge of consequences alone is not sufficient to ensure control. Another factor is maturity. It is particularly important to remember that the development of self-control is an indication of growing up. To expect a high degree of intelligent foresight and voluntary restraint on the part of the young child is to ignore the important fact that the ability to control one's behaviour increases slowly with developing maturity.

But knowledge of consequences and sufficient maturity do not necessarily guarantee self-control. It is primarily necessary that parents and the teacher should provide during infancy, childhood, and adolescence, opportunities for the child to develop self-control and through these opportunities to learn that it contributes to well-being and happiness. When the child's behaviour is almost completely directed by overly protective parents and teachers he has little opportunity to develop self-control. He should be encouraged to make decisions for himself. These decisions may not possess the wisdom of an adult's, but they are the child's solutions of life problems. They may bring unhappiness to him but, in accepting the consequences, he will learn one of the most important lessons in life, namely the necessity of controlling one's behaviour in terms of future consequences.

The practice of self-control has a wide application. It applies to rest and activity, eating and drinking, playing and working. Control of emotional expression towards both objects and persons is important.

In supplying children with information concerning the consequences of certain undesirable types of behaviour, it is of the utmost importance that such information should be accurate and scientific. There is no justification for exaggeration, emotionalism, or any other appeal which runs counter to common sense and accepted pedagogical procedures.

The importance of regarding the use of alcohol and tobacco as a matter involving self-control should be emphasized in health instruction. Such teaching should be given when the child has reached an appropriate age and grade level in the school. As in all health teaching, instruction in these matters should grow out of life situations within the comprehension of the child.

**Alcohol.** The assumption of control by governments of the distribution of alcohol for beverage purposes has placed an added responsibility on educational authorities in the matter of temperance instruction. The fact that a certain percentage of the public is strongly opposed to both the manufacture and the use of alcohol should not militate against the presentation of the subject through sound pedagogical methods.

The unfavourable influence of alcohol in the physical health of the consumer is often confused with its effects on moral and social behaviour. While the absolute divorcement of the physical and moral aspects of the subject is not possible, and while the point of view of those who object to the consumption of alcohol is appreciated, the emphasis in this Handbook is directed largely to its bearing on health.

**Physiological Effect.** When burned in the body, alcohol furnishes both heat and energy and in this regard might technically be compared with sugar and starch. If, however, it were to be consumed as a source of heat and energy, the amount required would be far in excess of the amount known to be harmful. Any claim, therefore, that its advocates may make on the score that alcohol is a food should not be considered seriously.

**Alcohol as a Producer of Heat.** The feeling of warmth produced by the ingestion of alcohol gives the consumer a false impression of its heat-producing qualities. While there is an increase in the peripheral circulation, due to dilation of the superficial blood-vessels, the body temperature is in no way increased; in fact, it may be lowered.

**Effect on Digestion.** When presented in a palatable form and in small quantities, alcohol increases the flow of saliva and has a slightly stimulating effect on the digestive juices. Taken in larger quantities it decreases the desire for food and retards digestion; still further consumption causes severe nausea and vomiting. Particularly to be condemned is the practice of taking alcohol in the form of spirits undiluted and on an empty stomach.

**Action on the Nervous System.** Authorities regard alcohol as being a nerve depressant, without any stimulating qualities. What have been considered stimulating effects are due to freeing in the motor area the restraining influence of the higher nerve centres. When taken in small quantities alcohol may give one a feeling of well-being, with increased assurance. Larger quantities lead to loss of emotional control and of self-restraint; muscular control



is inhibited; and judgment is clouded. Still larger quantities lead to loss of motor control, to maudlin speech, and to deep sleep.

**Psychological Effect.** This aspect of the subject is admirably summed up in the report of the Advisory Committee of the Medical Research Council, (England) "Alcohol—Its Action on the Human Organism." The consumption of alcohol leads to:

1. Uncritical satisfaction of the subject with his performance.
2. Disregard of events and conditions normally evoking caution of act and word.
3. Trespass of rules and conventions previously respected.
4. Impaired appreciation of the passage of time.
5. Loquacity.
6. An argumentative frame of mind.

**Pathological Effects.** Taken in large quantities and for a protracted period alcohol may cause chronic inflammation of the stomach or of the intestinal tract. It is suspected under similar circumstances of increasing arterial tension, with resulting sclerotic changes in the blood-vessels, and may cause irreparable damage to both kidney and liver.

The statement that the consumption of alcohol causes a lowering of resistance to infection of the respiratory tract and to sepsis following an accident or an operation is confined to chronic alcoholics or to those suffering from acute alcoholism.

**Medicinal Value.** For a long time both doctors and laymen believed that alcohol possessed important medicinal values. While it is admitted that, on occasions, and with appropriate safeguards, it has some therapeutic value, its use as a form of treatment is now very limited. More effective therapeutic measures have replaced it.

**Prophylactic Value.** The belief that alcohol helps the body to resist infective organisms is without present scientific foundation.

**Action on Social Progress.** The use of alcohol is strongly condemned on the score of its influence on the spread of venereal disease and crime. Because of its power to remove normal inhibitions, it increases the possibility of irregular sexual relations. Crimes are committed as the result of failure to retain the sense of discrimination between things trivial and things fundamental, together with loss of self-control. It would appear that many motor accidents are the direct consequences of indulgence in alcoholic beverages.

**Tobacco and Its Use.** The use of tobacco is age-old. It is smoked, inhaled as snuff, and chewed. The tobacco plant grows to best advantage in semi-tropical countries, although it is widely cultivated in many parts of the



temperate zone. Tobacco varies not only in its aroma when burned, but in the texture of its leaf and also in the amount of nicotine which it contains.

**Physiology.** Nicotine, which is the alkaloid contained in tobacco, is highly poisonous. It is presumed that the ill-effects of tobacco result largely from the inhaling or the swallowing of nicotine. This drug in minute doses lessens the contractions of the involuntary muscles of the bronchi, produces peristalsis, and has a tendency to slow up the heart action. In larger doses, it causes a slow, weak pulse, nausea, vomiting, and often diarrhoea. These symptoms in a modified degree may be noticed in one who is beginning to smoke.

Certain other ingredients of tobacco have a deleterious effect when burned. Pyrodine is responsible for the throat irritation which sometimes results from excessive smoking.

**Pathology.** Not as much is actually known about the ill-effects of the habit of tobacco-smoking as one might rightly expect. While many people have used it for protracted periods without evident ill-effects, its use has obvious disadvantages. It is an expensive habit. It is potentially bad for the throat and upper air passages, gastric mucosa, and the circulatory system. In the young it is usually associated with idleness, undesirable gang activities, and inferior scholarship.

When inhaled, tobacco smoke has greater possibilities of harm than when it is not inhaled. Discussions regarding the least harmful form of smoking are constantly taking place. Little accurate scientific information is available in support of the assumption that the practice of smoking tobacco in the form of cigarettes is less harmful than cigar or pipe smoking. The ill-effects of smoking are determined to some extent by the variety of the tobacco, its humidity, and the density and shape of the cigarette or the cigar. A loosely rolled cigarette, a dry cigarette, or a thick cigar gives off more nicotine than a densely rolled, damp, or thin cigarette or cigar. Despite the claims of certain manufacturers, efforts to produce a de-nicotinized cigarette have been unsuccessful.

The use of tobacco by children cannot be too strongly condemned. The child should be urged to refrain from its use until he is grown up. He will then have mature judgment and increased self-control, and will be able to weigh the presumed advantages against the known disadvantages.

## CHAPTER X

### SAFETY AND FIRST AID

During the last few years the number of deaths and injuries from accidents among children of all ages has reached alarming proportions in this province. The vast majority of these accidents have been the direct result of carelessness on the part of somebody, if the term carelessness can be taken to include ignorance, stupidity, and what appears on occasion to be arrant disregard of the rights of others. Much time and some thought have been expended on devising measures to lessen this rising toll of injury and death. If the weight of educational authority were thrown behind a sound accident-prevention programme good results would undoubtedly follow.

As a preliminary step to any effective presentation of the subject of safety, the teacher should acquaint himself with the factors which contribute to accidents.

The type of accident is determined not only by the locality but also by the age and sex of the child concerned. Drowning is the commonest cause of accidental death among boys between the ages of seven and fifteen years. In the main, drowning accidents are due to insufficient skill in swimming, careless handling of boats, failure to observe the rules of common sense in swimming or diving, or bravado and recklessness. It is felt that some useful instruction in the fundamentals of swimming might be given even in schools where no pool is provided. The seasonal inclusion of instruction in life-saving in the recreational and physical activity programme of the school will focus the attention of those who are most in need of instruction on the hazards of swimming and water sports. A knowledge of the accepted methods of resuscitation should be an essential part of safety education in the senior grades of elementary schools. Skill in the procedures of resuscitation is valuable to both young and old. It should, however, be understood that sustained and arduous effort is required. An adult should, therefore, be called immediately in case of any water accident.

The fact that in Ontario over 3,000 people of all ages have been killed and over 52,000 injured by motor cars during the last six years is sufficient warrant for public attention and concern. Children should be impressed with the need for caution on public highways and streets. They should learn that highways and streets are not safe places for play and that carelessness in the use of bicycles, tricycles, scooters, sleds, and roller-skates may result in harm not only to themselves but to others.



Accidents within the home are as frequent as traffic accidents. Statistics indicate that many accidents to girls take place in the home. Falls on stairways or over carelessly placed objects, including toys; burns and scalds; wounds resulting from the careless use of sharp instruments; injury from firearms and fireworks—these are some of the commoner types of preventable accidents that occur around the home. The necessity for constant care in the avoidance of unnecessary hazards cannot be over-emphasized.

Advantage should be taken of the regular fire drills held in all schools to emphasize the enormous wastage of life caused by fires which get out of control. Children should be urged to avoid any possibility of contributing towards the loss of life from fire. They should also be told what they should do in case of fire.

The instruction in safety outlined in this Handbook throughout the grades has avoided any emotional or sensational appeal. It has been made an integral part of health education, and is based on recognized pedagogic principles.

**The Responsibility of the School in Case of Illness or Accident.** School authorities assume certain responsibilities for the safety of the child while he is at school. Many centres have established medical and nursing services. Where this has not been possible some schools have met their responsibility by arranging for emergency medical and transportation services. There are, however, many schools in which the boards have made no definite arrangements for any such service. In the case of illness or accident at school the first responsibility of the teacher is to the sick or injured child.

An accident which is obviously serious and involves a major injury may occur on the school premises. In such a case the teacher should (1) call a physician immediately, (2) cover the child, and (3) insist that he lie where he has fallen until medical help arrives. The number of accidents which terminate fatally would be materially reduced if such procedures were followed. Safety is the ultimate object of caring for the child and it should not be sacrificed to comfort. There are, however, many situations in which a physician is not readily available. In such cases the teacher should use his best judgment. If he deems it wise he should have the injured child removed to the nearest shelter. He should supervise the moving to see that it is done with the least possible danger and with the least possible handling of the injured child. Accepted methods of handling injured persons are demonstrated in First Aid Instruction.

Although some accidents which occur at school may not appear to a non-medical person to be serious, it is always well for the teacher to exercise extreme care. For the future welfare of the injured child the teacher should insist that he be made as comfortable as possible consistent with the least amount of handling until medical help arrives. The only general exception to this rule would be in the event of severe arterial bleeding. In such a case



every effort should be made to control the bleeding until the physician arrives. If the hemorrhage is from an arm or a leg, a tourniquet properly applied will control the bleeding; in other locations constant pressure at the point of the hemorrhage is the only helpful measure to take until medical care is obtained.

**First-Aid Service.** Giving emergency aid to the pupils during school hours is something a teacher may be called upon to do at any time. The purpose of first aid is to care for and protect the patient until a physician can diagnose the condition and prescribe treatment.

For his own protection and for the welfare of the child the teacher is well advised to notify the parent in writing when a child suffers from illness or from accident while under the care of the school. This is essential if a child faints in school, since fainting is a symptom which indicates that the child requires medical attention. In cases of cuts and burns it is advisable to notify the parents, particularly if the wound is on the abdomen, or if it is deep, or if it spreads over a fairly large area, even though only the superficial layer of the skin is involved. Danger of infection through an open wound is very real.

In an emergency the teacher should make every effort to notify the parents and secure instructions from them before the child is permitted to leave the school and the care of the school authorities. If a doctor has been summoned, he will, of course, take charge. If it is impossible to obtain instructions from the parents, school authorities should arrange for the child's removal. In no circumstances, however, should a child who has been injured or who has been taken ill be allowed to leave the school alone. He should be accompanied to his home by one of the teachers or by a senior pupil who is sufficiently reliable and is competent to take responsibility. Many tragedies which have occurred among school children could have been avoided had this rule been followed.

**First Aid.** The following are some of the more common first aid procedures:

**BURNS:** Apply Tangel from tube; cover with gauze; fix firmly with bandage or adhesive.

**BITES:** Apply iodine.

**NOSE BLEED:** Have patient lie down; apply cold compress across the bridge of his nose; do not allow him to blow his nose.

**FAINTING:** If a child has fainted, place him lying on his back; dip a cloth in cold water, wring lightly, and apply across his forehead. If a child feels faint, have him sit on a chair and place his head between his knees. Watch him closely until he is fully recovered.

**CUTS, SCRATCHES, AND BRUISES WITH BROKEN SKIN** should be carefully washed with swabs of clean absorbent cotton dipped in green soap solution, dried with swabs of clean absorbent cotton, and covered with iodine. For protection, clean gauze should then be applied and secured firmly with a bandage or adhesive tape.

The first aid cabinet in the school should contain only such material as will be useful to the teacher in rendering first aid. Any further treatment is the responsibility of the physician, not of the teacher.

This cabinet should contain the following essential supplies:

1. Tincture of green soap—6-oz. bottle.
2. Iodine—1-oz. bottle.
3. Sterile absorbent cotton—small package.
4. Sterile gauze—small package.
5. Adhesive tape—small package.
6. Bandages, 1-inch width—1 package.
7. Bandages, 2-inch width—1 package.
8. Tube of Tangel.
9. Small white enamel basin.
10. Scissors.

NOTE: Green soap solution is made by adding one dessert-spoonful of tincture of green soap to one pint of water.

**Instruction in First Aid.** First aid is based on technical procedures which can be explained and demonstrated only by a person with the necessary training. Pupils in Grades VII and VIII should receive instruction in first aid and resuscitation. The local medical society or health authorities are, as a rule, interested and willing to give the necessary technical instruction. Before planning for this instruction the teacher should make a formal request to the school board, asking that this service be arranged for his class, and specifying the day and the hour which would be most convenient. It has been found that from four to six demonstrations are usually required for a course in first aid.

## CHAPTER XI

### MATERIALS FOR HEALTH TEACHING

Health education has been defined as the sum total of all experiences which favourably influence habits, attitudes, and knowledge relating to the health of the individual, the family, the community, and the race. The teacher will find many varied materials and activities helpful in the teaching of this subject. Of first importance as a source of such materials is the child himself—everything he does in the twenty-four hours of the day, and his experiences arising out of living within his particular environment. The value of such materials lies in the fact that they have reality for the child; that they have interest for him; and that he can see their practical application to his everyday life.

The world in which the child lives is a world of children. He is always interested in learning how other children live—the food they eat, the games they play, the homes that shelter them, and the clothes they wear. When presented with scientific accuracy and vital realism such studies broaden the horizons of the child's knowledge and culture and they help him to understand problems of his own health and growth. Among other interests in the child's world are those things which are alive, such as the pets, trees, flowers, animals, and birds living in the garden, in the woods, and in the park. His interest centres around the fact that they are alive and that they grow. Living things are materials for use in every grade. The extent of their use in health education will be determined by the age of the child.

The teacher should have a reasonable knowledge of the home environment of every pupil, since situations and experiences within the home and the family connection exert the most vital of all influences on the health and personality of the child. The home will furnish materials and activities growing out of life situations and health problems which will provide topics of vital interest to him. Such materials should be used with scientific detachment and with a discernment which recognizes that while some of them are capable of universal application, the usefulness of others may be limited to a single situation. When judiciously used, materials from the home will not embarrass any child; on the contrary, they will be a means of helping all to establish desirable health practices within their individual capabilities and within any limitations presented by the home environment.

The community also furnishes materials and activities of which the teacher should take advantage. Each community will have distinctive problems, resources, and facilities affecting the lives and health of the people. To arouse



the interest of the child in community health the teacher should have the child study his own and other communities. Through this he will see how community health services work and what they do for people. He will understand how libraries, museums, parks, playgrounds, swimming pools, markets and abattoirs are part of the community's provision for the healthful living conditions of its citizens. The teacher should use the resources, materials, and activities growing out of the daily life of the people in such matters as sanitary food; milk and water supplies; regulation of traffic; protection by firemen and police; lighting and cleaning of streets; and sanitary disposal of community waste and sewage. Many materials and activities arising from disasters such as an epidemic, a flood, or a fire will furnish useful topics in the study of community health. Statistics relating to local health conditions should be used and these will lead to a use of provincial, federal, and international statistics. The last named may be secured from the central office of the League of Nations Society.

Field trips are a type of experiment. They verify certain conclusions or they solve problems which have arisen. The field trip should supplement class instruction. Its purpose is to re-enforce or clarify information which the child has derived from reading or from other sources. Before a field trip is undertaken there should be some preliminary preparation so that the child will have some idea of the significance of the various activities and equipment which he is about to observe. If adequate preparation has been made, a visit to a dairy farm, a milk pasteurization plant, a water-works plant, or other community service will prove interesting and valuable. During the trip he will find answers to questions which have arisen in his own mind. Perhaps one of the most important results of a field trip is the discovery by the child that men and women are engaged in full-time services which contribute to the health and well-being of the people of the community.

From the daily life of the child in school there will also emerge valuable materials and activities. The environment of the school, the instructional programme, the health services, the social organizations within the school group—all contribute materials and activities which affect the health of the children.

Reading materials are not helpful in developing habits. Materials with which the child may *do* are the only useful aids to habit formation. The teacher will, therefore, use the fundamental equipment of the class-room and of the school plant as the most effective materials and activities in the formation of desirable habits by the child.

A healthful school environment means the organization of all experiences throughout the day so that each child will have many opportunities to explore his capacities and secure satisfactions from successes in varied activities. Many materials and activities arise from various elements in the school environment: the atmosphere of friendly relationships between pupil and

teacher and between pupil and pupil; recreational and playground facilities; Arbour Day, the Christmas concert, school picnics and parties, Junior Red Cross, and other club organizations; safety and fire protection; the grounds around the school; the school garden; facilities for drinking and hand-washing; sanitary toilets; disposal of refuse; heating, lighting, ventilation, and cleanliness of the building; rest facilities for children who may be ill, injured, or indisposed; the furniture and furnishings of the school; and the daily programme of the school with provision among other things for rest and relaxation, recess and noon-hour periods, and reasonable homework assignments.

In dealing with the children the school health services provide experiences and situations replete with vital materials and activities directly related to health and which should be utilized in helping the child to understand his personal problems of health and growth.

In the past many artificial devices were used to motivate the health work of the school. These included such devices and materials as: approval of the teacher; appeals to self-interest; honour rolls; and stars, prizes, and other rewards. When used, they distracted the attention of the child from the real objectives of establishing and maintaining health practices and of acquiring knowledge to rationalize such habits. The child's interest became focused upon the device rather than upon the content of health education. Teachers may have been led to resort to them because of their apparent usefulness as an aid to learning. The measurement of satisfactory results, however, in terms of permanence would seem to indicate that such devices have no place in scientifically planned health education. As incentives to desirable health behaviour they are now discarded. Valid materials of motivation are to be found in the child's interest in his own growth and development; in his satisfaction of accomplishment for its own sake; in meeting the challenge of solving a problem successfully; and in developing his sense of responsibility for reasonable service to others within his own capacities.

When related to real experiences within the child's daily life, direct health instruction will influence the health behaviour of the child and contribute to the establishment of desirable health attitudes. For example, the teacher should lead the child to find for himself the story behind the discovery of such an interesting tool as the magnifying glass previous to his use of it as a tool. The child will then have an appreciation of it as a definite and tangible example of one result of scientific research which has been of benefit to mankind from the time of its discovery to the present. He will see one application of it in the eye-glasses which may be worn by himself or his family or his playmates. In direct health instruction the teacher should use such materials and activities as the magnifying glass, the thermometer, the microscope, the balanced aquarium, the class museum, and the class library; the sand table or other suitable arrangement for assembly of materials; simple



experiments in natural science; the child's participation in gardening at home or at school; the care of pets and other living things; and the recreational activities and games of the home, the class-room, and the playground. These materials and activities are available to every teacher. Because they are readily available, they should not be overlooked nor should their importance be disregarded. The standards of the materials and activities used in the school should at all times reflect the best type of home life within the community. The school lunch offers materials and activities directly concerned with health instruction. Many situations arising out of the handling of equipment in manual arts involve materials and activities applicable to safety education. In addition to providing opportunities for the child to learn skills and body control, the play and recreational activities of the school furnish valuable materials in the development of emotional control and social health. His participation in games involving throwing, running, jumping, climbing, catching, and other physical activities provides materials which exert a favourable influence on his physical health. Many other materials are useful in the class-room in health education. Maps showing sources of materials for food, shelter, and clothing are examples of such.

Information relating to progress in health practices and personal characteristics of weight and height are matters for individual record in all grades. Class-room charts of health practices have been used and have been found to have a limited value in the junior grades. When used in the grades above Grade IV, however, the class-room chart has been found to hinder and discourage the health work of the school. The teacher should lead the children to appreciate the significance of scientific statistics which relate to the control and prevention of disease and which have been compiled by authoritative investigators and specialists. Charts, tables, graphs, and pin maps are of interest to senior pupils in the study of statistics relating to such topics as accidents in the community; the distribution of cases and of deaths during an epidemic; the effect of toxoid and other immunization measures in the control of communicable diseases; and the location of pasteurization, waterworks, and sewage disposal plants within the areas in which the child is interested.

A health scrap-book is exactly what it is named. It has no value in a class-room where the purpose of health education is a complete unifying of all experiences and activities conducive to health. The scrap-book is no longer being used as material in health education.

Each child should, however, have a health book in which he records his progress in health practices; his increasing knowledge relating to his own health and that of the community; his notes of experiments, enterprises, projects, and units in the field of health.

Posters brought into the class, whether produced by outside agencies or made by the pupils of another class, lack value as material in health education. The teacher will find, however, that the child will wish to express his own



ideas on health in a graphic form. He may do this through the medium of an original poster in which he expresses his own idea of a health practice which he understands and is carrying out, or of an item of scientific information relating to health which he comprehends and which is of interest to him. The learning of a so-called health play which is written by an adult, and which is entirely apart from the child's own experience, is found to have very little value in health teaching. The use of such in the class-room is time-consuming and the results are negligible. A presentation which demands practising, rehearsing, and final staging at night, with resultant fatigue and excitement, produces a strain which is detrimental to health. This practice violates the very points of health behaviour on which the health education programme in the school is based.

Health plays written by the children are a means of self-expression. They have some educational value and have a limited place in health education if presented in the class or before a small group of pupils and parents at a suitable time and under suitable conditions.

Reading materials are a necessity in health education. Reference books for the teacher and text-books for the pupil are guides to the understanding and utilization of health materials and activities. It is imperative that there be recognized authoritative sources of information for both teacher and pupil. Lacking reliable books, the teaching of health becomes discursive, dogmatic, unscientific, and meaningless. Presentations of health information through fairy stories, dreams, and highly improbable situations which arouse undesirable emotional responses have no place in modern health education. Likewise those books which present growing up as a series of stereotyped games and didactic rules are psychologically unsound and uninteresting to the normal child. They do not arouse a true interest in fundamental health practices; they do not help the child to develop desirable skills in health techniques; nor do they lead the child to an appreciation of scientifically accurate information. The text-book in the hands of the pupil must help him to solve the problems which relate to his own personal growth and the problems of health which he meets in his life in the school, in his home, and in his social contacts with others. Primary texts should deal with health practices in simple life situations familiar to the child and presented in such a way that the child readily sees himself in the situations involved. Primary books will, therefore, deal with the child's everyday life in his home, in his family relationships, in his school relationships, and in his social relationships with his playmates. In the intermediate grades the texts should continue to be built upon health practices but they should show the child a variety of ways of doing things. They should introduce to him the health practices of children in other countries and should lead him to appreciate the fundamental principles of life. Through a study of living plants and animals these texts should deal with simple instances

drawn from the field of biology. Thus they should lay a foundation of scientific knowledge upon which the child in the senior grades may build when he studies his own body and its care.

In the upper grades of the elementary school the texts should give accurate and scientific information relating to personal and community health. These books should leave with the child an appreciation of the fact that no book on health can be accepted as final. Health knowledge is constantly changing and enlarging, since it is built upon discoveries constantly being made in the broad field of science throughout the world. From statements which he meets every day in newspapers and magazines, over the radio, and through other media, the child realizes that there are frequently conflicting opinions regarding health and disease. He learns that reliable persons publish reliable information arising from the new discoveries of science, while unreliable persons publish information which is not reliable. He will want to be able to differentiate between the true and the false. His health work in school should, therefore, be a day-to-day training in criticism to enable him to evaluate health information as he meets it in the course of his daily life in the school, in his home, and in the community. As stated by Dr. Donald B. Armstrong, President of the National Health Council, "Part of the training of a child might well be to learn and unlearn without disillusionment. An ability to evaluate or to know when and how to test the information on health, broadcast to the world through so many channels, is important in the practical conduct of life."

For satisfactory use by children, materials in health education must be adapted to differences in age and in development; they must provide for increasing difficulty in vocabulary and ideas; they must meet the changing needs of the child and his enlarging interests and responsibilities. They should encourage self-guidance by presenting intelligent solutions of health problems through scientific and understandable knowledge and, finally, they must contain an element of interest and lead the child to an intelligent but in no way morbidly introspective interest in matters relating to health.

In addition to the above, reading materials must be written in language which will conform to the best standards of English usage; and the illustrations, if any, should be in accordance with the best canons of art.

Other reading materials, such as periodicals devoted to health and special articles dealing with specific health topics, are useful sources of information to the teacher. If in doubt as to the scientific accuracy of health information the teacher should consult the school physician, dentist, or nurse. If professional health services are not organized for the school the teacher may apply for a critical opinion or for direction in verifying health information to the local medical officer of health, to the provincial and federal departments of health, to the medical association, to the dental association, and to other agencies recognized as authorities in their respective fields.



## BIBLIOGRAPHY

## General:

- Bassett, Clara: *Mental Hygiene in the Community*. Macmillan, Toronto, 1936.
- Bassett, Clara: *The School and Mental Health*. The Commonwealth Fund, New York, 1931.
- Board of Education: *Handbook of Suggestions for Teachers*. His Majesty's Stationery Office, London, 1937. (Dawson, Toronto.)
- Board of Education: *The Primary School*. (Hadow Report.) His Majesty's Stationery Office, London, 1937. (Dawson, Toronto.)
- Crowther, J. G., ed.: *Biology in Education*. Heinemann, 1933. (Macmillan, Toronto.)
- Curie, Eve: *Madame Curie*. Doubleday, Toronto, 1937.
- Dougherty, Gorman and Phillips: *Elementary School Organization and Management*. Macmillan, Toronto, 1936.
- Fox Meadow School: *Willingly to School*, by the school staff. Scott, Foresman, 1936. (Gage, Toronto.)
- Grout, Ruth E.: *Handbook of Health Education, A Guide for Teachers in Rural Schools*. Doubleday, Toronto, 1936.
- Hoban, Hoban & Zisman: *Visualizing the Curriculum*. The Cordon Co. 1937. (Clarke, Irwin, Toronto.)
- Horder, Lord: *Health and a Day*; addresses. Dent, 1937.
- London Times: *The Nation's Health*. Reprinted from the National Health Number of *The Times*, Sept. 30, 1937.
- Morgan, John J. B.: *Keeping a Sound Mind*. Macmillan, Toronto, 1936.
- Morgan, John J. B.: *Psychology of the Unadjusted School Child*. Macmillan, Toronto, 1936.
- National Education Association of the United States: *Fit to Teach*. Ninth Year Book Department of Classroom Teachers, 1938. National Education Association, 1201 16th St. N.W., Washington, D.C.
- New York State Education Department: *Everyday Behaviour of Elementary School Children*. Report of a study of the twenty-four-hour-day health behavior of 3,512 individual children. Albany, N.Y., 1934.
- New York State Education Department: *A Guide to the Teaching of Health in the Elementary School*. Albany, N.Y., 1936.
- New York State Education Department: *Handbook for Rural Elementary Schools. School Organization*. 1936. Albany, N.Y.
- New York State Department of Health: *The Psychological Approach to Child Health*. Albany, N.Y., 1933.
- Obermer, E.: *Health and a Changing Civilization*. Nelson, Toronto, 1937.
- Pressey, S. L.: *Psychology and the New Education*. Harper, 1933. (Clarke, Irwin, Toronto.)
- Rivlin, H. N.: *Educating for Adjustment*. D. Appleton-Century, 1936. (Ryerson, Toronto.)
- Seabury, David: *How to Worry Successfully*. Little, Brown, 1936. (Dent, Toronto.)
- Stead, H. G.: *Full Stature—Education and Tomorrow*. Nisbet, 1936. (Copp, Clark, Toronto.)
- Symonds, Percival M.: *Mental Hygiene of the School Child*. Macmillan, Toronto, 1936.
- Turner, C. E.: *Principles of Health Education*. Heath, 1932. (Copp, Clark, Toronto.)
- Williams, J. F.: *Methods and Materials of Health Education*. Nelson, Toronto, 1936.
- Williams and Brownell: *The Administration of Health and Physical Education*. W. B. Saunders Co., 1934. (McAinsh & Co., Toronto.)
- Wood and Lerrigo: *Health Behaviour*. Public School Publishing Co., (Ryerson Press Toronto.)

## Materials for Health Teaching:

- Allen, Arthur B.: *Art and Artistic Handicrafts for the School*. Harrap, 1932. (Clarke, Irwin, Toronto.)
- Bechdolt, Jack: *The Modern Handy Book for Boys*. Garden City Publishing Co., Inc., 1933. (Longmans, Toronto.)
- Camm, F. J.: *Hobbies, New Annual*. Newnes, 1937. (Collins, Toronto.)
- Collins, A. F.: *Book Crafts for Junior Pupils*. Dryad Press, 1936. (Macmillan, Toronto.)
- Flexner, Cane and Clark: *Hand Puppets,—a practical manual for teachers and children*. Samuel French (Canada) Toronto, 1937.
- Gull, Hilda K. F.: *Projects in the Education of Young Children*. McDougall, 1936. (Clarke, Irwin, Toronto.)
- Horth and Horth: *101 Things for Little Folks to Do*. Lippincott. (Longmans, Toronto.)
- McConachy, Beattie and Morgan: *Music Highways and Byways*. Silver, Burdett, 1936. (Gage, Toronto.)



- McConachy, Beattie and Morgan: *Music of Many Lands and Peoples*. Silver, Burdett, 1932. (Gage, Toronto.)
- Mochrie and Roseaman: *Felt Toys*. Dryad Press, 1936. (Macmillan, Toronto.)
- Munger, M. P.: *The Book of Puppets*. Lothrop, 1934. (Longmans, Toronto.)
- Sarg, Tony: *How to Make and Operate a Marionette Theatre*. Samuel French, (Canada) Toronto, 1937.
- Sharman, R. N.: *Classroom Handwork*. Pitman, Toronto, 1926.
- Tanner, Robin: *Children's Work in Block Printing*. Dryad Press, 1936. (Macmillan, Toronto.)
- Tomlinson, R. R.: *Crafts for Children*. Studio Publications, London, 1937. (Clarke Irwin, Toronto.)
- Whanslaw, H. W.: *Puppetry for School and Home*. Nelson, Toronto, 1937.
- Whanslaw, H. W.: *Everybody's Marionette Book*. Gardner, 1937. (Nelson, Toronto.)
- Whilhelm, L. M.: *With Scissors and Paste*. Macmillan, Toronto, 1935.
- Wilson, D. F.: *Primary Industrial Arts*. Batsford. (Copp, Clark, Toronto.)
- The Wonder World of Things to Make and Do*. Collins, Toronto, 1937.

### Physical Education:

- Brandreth, Gordon: *The Canadian Book of Games*. Ryerson, Toronto, 1931.
- Davies and Storr: "*Con Moto Rhythmic Series*. Handbooks for: Infants; Juniors; Seniors. University of London Press. 1937. (Clarke, Irwin, Toronto.) *Music for the "Con Moto Rhythmic Series."* Technical Exercises and Companion Music Books for: Infants; Juniors; Seniors; Augener Limited, 1937. (Clarke, Irwin, Toronto.)
- Forbush and Allen: *The Book of Games for Home, School, and Playground*. Winston, Toronto, 1927.
- Hoben, Alice M.: *The Beginner's Puppet Book*. Noble & Noble, 1938. (Clarke, Irwin, Toronto.)
- Holmes and Davies: *Organized Play in the Infant and Nursery School*. (with music.) University of London Press, 1937. (Clarke, Irwin, Toronto.)
- Horrigan, Olive K.: *Creative Activities in Physical Education*. Barnes, 1931. (Hendry, Toronto.)
- Lynn, Rohrbough: *Handy II*. R. C. Sidenius, 150 Locke St. N., Hamilton, Ont.
- Mason and Mitchell: *Active Games and Contests*. Barnes, 1937. (Hendry, Toronto.)
- Matthews and Mitchell: *New Team Games*. Pitman, Toronto, 1935.
- Mitchell, Elmer D.: *Sports for Recreation*. Barnes, 1936. (Hendry, Toronto.)
- Neilson and Van Hagen: *Physical Education for Elementary Schools*. Barnes, 1935. (Hendry, Toronto.)
- Neumeyer, M. H. and E. S.: *Leisure and Recreation*. Barnes, 1936. (Hendry, Toronto.)
- Pangburn, W. W.: *Adventures in Recreation*. Barnes, 1936. (Hendry, Toronto.)
- Reynolds, H. Atwood: *The Game Way to Sports*. Barnes, 1937. (Hendry, Toronto.)
- Riggs, Austen Fox: *Play*. Doubleday, Toronto, 1935.
- Shafer and Mosher: *Rhythms for Children*. Barnes, 1938. (Hendry, Toronto.)
- Wickett, F. T. C.: *Rote Songs and Singing Games*. Gage, Toronto, 1937.

## PART II

# HEALTH INSTRUCTION IN THE GRADES

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### CHAPTER XII

## HEALTH INSTRUCTION

There are three main objectives of Health Instruction:

To establish and maintain proper Health Practices,

To acquire Health Knowledge,

To develop desirable attitudes toward Health and Health Practices in personal and community life.

The establishment and maintenance of health practices can be attained only by constant repetition. Forming a habit is much like making a path. We cannot make a path through a field by thinking about it or talking about it; we must walk across the field not once but many times. So it is with health habits. Repetition is necessary to form each habit. It is the sustained repetition that brings results.

Progressively planned health instruction will arouse the interest of teacher and pupil. Progressive planning means a new approach each year suitable to the advancing age and grade level of the child and the presentation of materials in keeping with his physical, mental, emotional, and social development.

In health education behaviour and attitudes are more important than knowledge, yet health knowledge has a definite value. It furnishes the basis of rational thinking upon which the child builds and maintains satisfactory practices and desirable attitudes towards health. These are built up and maintained during childhood and adolescence and are carried over into adult life.

Health instruction must be based upon modern educational principles, and should be presented through life situations so that the child will think of health as a matter of personal conduct rather than as a subject of instruction. The greater the number of situations in which the child carries out satisfactory health practices in school the greater will be the number of situations in which he will select satisfactory health behaviour outside of school. He learns by doing, and will acquire a habit if he has varied opportunities for practice. The teacher should, therefore, afford every possible opportunity for practising habit-forming activities in a favourable environment. He should



relate the health instruction of the school to the child's life outside the school. The children should be encouraged to bring experiences of the home and the social groups of which they may be members into class-room activities and discussions. School work will then be related to experiences outside of school. The procedures of learning within the school will have a carry-over to life outside the school and later into adult life. The teacher should not forget that the child continues to live and learn outside of school hours.

Training and repetition are necessary for the formation of good habits. The child must be shown how to do those things which are conducive to his health and then apply this knowledge to his conduct. The more frequently the child engages in an activity, the easier its practice becomes. To avoid monotony and loss of interest it is important that new materials and new approaches should be provided. Every child may win success in health activities; such success will afford him a feeling of satisfaction and instil in him the desire to repeat such activities. It is in this way that desirable health habits will be formed. As the child develops he wishes to know the reasons for observing certain health practices. These should always be given to him in terms of accurate and scientific health knowledge which he can understand.

The child should learn that the ultimate reward of health practices is to be found in his growth and physical development rather than in artificial compensation such as stars, awards, pennants, and early release from school. Teachers who have attempted to bring about quick results by these artificial devices have discovered that these results are not permanent. Such devices are open to serious criticism because of their discouraging influence upon certain types of children. Without the use of awards the formation of good health habits may be slow but, when the habits are formed, they are more likely to be permanent. To secure lasting results, the child's attention should be focused at all times on achievement. The teacher should recognize that the child's best efforts will be called forth when he is competing against his own past record and not when he is seeking to excel the records of other members of the class.

There are certain factors which can be understood by the teacher only if he knows something of the heredity and home environment of the child. This knowledge will make it possible to relate instruction to the needs of the individual child. The success of all such instruction will depend upon the attitude of the teacher towards his own health, towards the health of the child, and towards the health of the community. The positive aspects of health should be emphasized at all times.

**Methods in Health Instruction.** The first essential to successful health instruction is interest and enthusiasm on the part of the teacher. The enthusiastic and resourceful teacher will determine for himself the particular procedure to be used in presenting to specific grades or age groups the ideas

suggested in the Handbook. Since the first objective of health instruction is the establishment of desirable health practices, the teacher should avail himself of a wide variety of experiences which approximate the actual conditions of the child's life. The reality of these experiences will arouse and sustain interest with resultant mental, emotional, and motor responses.

**Incidental Teaching.** Throughout the school day many situations arise which are definitely related to the health of the child. The teacher should take advantage of these to provide opportunities for good health practices and to direct the child's behaviour along positive and desirable lines. From such incidental teaching the child will learn that health behaviour persists throughout the day and is not for lesson periods only. The teacher should guard against dulling the interest of the child by didactic, trivial, and over-emphasized references to health.

**Correlation.** Health instruction is closely correlated with the various subjects on the curriculum. Learning which is correlated presents a unity to the pupil and thus becomes of most value in life. There are many opportunities for such correlations in the materials and procedures of learning of such subjects as natural science, social studies, English, household science, manual training, music, and art. The teacher should, however, guard against irrelevant and forced correlations since they are oftentimes illogical, lacking in spontaneity, and uninteresting to the child. At no time should the teacher lose sight of the aesthetic values of art, music, and literature. Correlations which result in confusion to the pupils and the production of drawings, rhymes, and parodies which offend against the canons of art should not be used. The integrity of each subject should be maintained in correlations.

**Direct Teaching.** Growing up is of major importance to the child and is a constantly changing experience for him. He is interested in all aspects of health since these help him to understand the various problems of growth which challenge him. These problems change with the age of the child and are of special concern to him in the intermediate and senior grades. A daily period of direct health teaching will be of interest to the child and will be a means of helping him to meet the problems connected with his growth.

The approach to health instruction should be through pupil participation in experiments and activities. Formal teaching should give place to experiments which involve the planning, creating, and assembling of materials by the pupils. Life situations as they arise in the school, on the playground, in the home, and in the community, should be studied, since these are associated with the child's problems in health.

**Units or Enterprises.** A unit or enterprise is a unified study of an actual life situation possessing objectives and purposes worth while to the child and within his comprehension. A unit or enterprise will require investi-



gation, research, simple experiments and other activities undertaken by the child both individually and also in co-operation with others.

Units and enterprises will clarify a life situation or give significance to certain experiences which have a fundamental bearing on the health of the child. Through discussion, interest will be aroused and the pupils will consequently seek an understanding of the problems involved. One of the valuable contributions of the unit is that it affords an opportunity for the purposeful planning of procedures by the children themselves, in an attempt to answer the questions which arise. Each objective should be clear, concise, and conducive to the establishment of motor skills, the gaining of information, and the establishment of attitudes.

The activities should be adapted to the age of the groups concerned and should be consistent with the desired objectives. There should be a variety of activities sufficient to secure the interested participation of all pupils. These activities should broaden the experiences of the children and should open up new interests and new modes of thinking in regard to life situations. The pupils work as individuals and in groups. As the enterprise progresses, there should be, from time to time, consideration of the various activities so that the children may see the contribution which each child and each group is making to the whole. Upon the completion of any enterprise arrangements should be made for a general review of the results by the pupils and an evaluation of these by the teacher.

Units and enterprises make it possible for the teacher to adjust the learning procedures to the needs and capabilities of the individual child. Opportunity is afforded to the teacher during the progress of the unit to give special attention to those children who require it. Through observation the teacher will gain personal knowledge of the child. This will include a knowledge of his emotional response when faced with a new and unfamiliar situation; his ability to undertake sustained and purposeful effort involving planning, initiative, experiment, and investigation; his ability to work in co-operation with others; his willingness to accept responsibility.

If successfully carried out an enterprise should help the child to understand his social environment through the study of a wide variety of life situations. It should lead to the establishment and maintenance of good health practices, to increased knowledge of his physical and social environment, and to improvement in the tool subjects of the curriculum. The value of an enterprise will be in proportion to the skill with which it has been developed.

The unit method places emphasis upon experiences and procedures rather than upon information and subject matter. The integration of a variety of experiences which have practical relationships gives the child a more adequate preparation for life. He discovers that life is not static but is dynamic and changing. His knowledge of it becomes, therefore, progressive and ever-enlarging.

Health in its widest interpretation is the capacity of the individual to sustain adaptive effort in meeting changes in his physical, economic, social, and moral environment with resultant feelings of happiness, satisfaction, adequacy, and security. Education should not be a substitute for experience. The child is living in a changing world and education should prepare him to meet new experiences calmly, fearlessly, and without emotional disturbance.

#### References for the Teacher:

- Board of Education: *Handbook of Suggestions on Health Education*. His Majesty's Stationery Office, London, 1934. (Dawson, Toronto.)
- Broadhurst and Lerrigo: *Health Horizons*. Silver, Burdett, 1931. (Gage, Toronto.)
- Collings, Ellsworth: *An Experiment with a Project Curriculum*. Macmillan, Toronto, 1929.
- Curriculum Making in an Elementary School*. Columbia University. Teachers College. Lincoln School. Ginn, Montreal, 1927.
- Dorris, Ann V.: *Visual Instruction in the Public Schools*. Ginn, Montreal, 1928.
- National Educational Association: (Year Book of Rural Education Department.) *Newer Types of Instruction in Rural Schools*. 1201 16th Street, N.W., Washington, D.C., 1938.
- New York State Education Department: *Guide to the Teaching of Health in the Elementary Schools*. Albany, N.Y., 1936.
- New York State Education Department: *Handbook for Rural Elementary Schools*. Albany, N.Y., 1936.
- Phillips and Cox: *The Teaching of Biology*. University of London Press, London, 1935. (Clarke, Irwin, Toronto.)
- Rose, Mary Swartz: *Teaching Nutrition to Boys and Girls*. Macmillan, Toronto, 1937.
- Stevens, Marion Paine: *The Activities Curriculum in Primary Grades*. Heath, 1931. (Copp, Clark, Toronto.)
- Wheeler, Olive A.: *Creative Education and the Future*. University of London Press, London, 1936. (Clarke, Irwin, Toronto.)
- Williams and Shaw: *Methods and Materials of Health Education*. Nelson, Toronto, 1936.



## CHAPTER XIII

### HEALTH INSTRUCTION IN GRADES I AND II, INCLUDING KINDERGARTEN

When the child first comes to school he leaves the small social unit of home and parents, enters into a community of children of his own age, and associates daily with another adult—his teacher.

If the child is to enter school in September, he should have a complete examination by a doctor in May or June, the report of which will be available to the teacher. This examination will allow ample time for the correction of any remediable physical defect. Every child should be protected against diphtheria by toxoid and vaccinated against smallpox before entering school.

The equipment of the kindergarten and primary rooms need not be elaborate or costly—the simpler the better. These rooms should be airy and sunny, and have adequate toilet, hand-washing, and drinking facilities, and a cloak-room where the child learns to be self-dependent in removing and hanging up wraps and in dressing himself. The rooms should be kept scrupulously clean, as little children often play on the floor. An outdoor playground with simple, safe equipment is desirable.

Since the child learns by imitation and suggestion, it is important that the teacher's own habits of life should be in accordance with the laws of physical and mental health.

While the kindergarten and primary classes are often busy, happy and noisy, the atmosphere should be free from tension. The teacher should not seek to dominate and mould the lives of the children; she should rather present opportunities through which they may develop their own personalities.

The teacher in these grades should greet each pupil individually as he arrives in the class-room. This greeting should not be standardized or formal, but should be personal and should convey to the child a feeling that he belongs to the school community.

Many teachers are finding that this individual greeting presents an opportunity to make the health and cleanliness appraisal of each child. The teacher is thus able to ascertain the health status of the pupils before the regular work of the class-room is begun. It is a guide in organizing and directing all class-room procedures so that these will promote the health of every child. The teacher should never assign a child any part in the health and cleanliness inspection of other children. The child finds that keeping clean, brushing his teeth, eating proper food, getting rest and sleep, and playing out-of-doors are all matters of interest to his teacher just as they are to his mother at home.

Rest periods should be arranged during which the child is taught to relax and rest. In many schools individual floor mats or sheets of heavy paper are provided so that the child may rest lying down.

In the primary grades, health means for the child living happily with others and with feelings of security and adequacy. He should, therefore, learn to live naturally with others. He should learn to submit to obedience in fire-drill; he should learn to conduct himself properly and carefully going to and from school; he should learn to use scissors and other class-room equipment carefully; he should learn to care for the class-room, playground, and school garden. The efforts of the school should be directed to the development of the child's self-reliance and self-control, so that he may become a happy member of the school group.

In these grades the child is interested in growing up. This fact should be used by the teacher to motivate all health instruction. Health practices at this stage are explained to the child in terms of growth only. The idea of health is abstract and conveys little meaning to the young child. There should be no attempt on the part of the teacher to make the child health conscious. Neither should the teacher leave with him the idea that any one aspect of his daily life is the determining factor of his health and growth. The child eats his food, wears proper clothing, secures proper rest and sleep, keeps himself clean, and plays happily with others. All these contribute to his development.

It is conceded that the greater responsibility for the child's health conduct rests with the home. His food, his clothes, his sleeping practices, his play and rest are largely determined by the parents. But the teacher should be able to lead the child through school experiences with other children to realize that he himself as well as his parents, has a responsibility for doing those things which will contribute to growing-up. The child should learn to remove outdoor clothing when he comes into the school; he should learn to hang up these clothes; he should learn to put on his wraps properly, to button them, and to prepare himself for going out-of-doors. If his clothes are wet or damp, he should, under the teacher's direction, hang them up so that they will dry. The teacher who puts on and takes off outdoor clothing, who buttons overcoats, who takes off and puts on goloshes and rubbers, and who hangs up wet clothes for the pupils, is failing to grasp real life situations with important health values to the child, and is depriving the child of important learning experiences. The child may be told all about caring for his clothes, but if he is not given the actual responsibility of looking after them, health teaching, so far as it relates to clothing, means nothing to him.

The teacher should be familiar with the home background and living conditions of each pupil. In many cases the work of the school will reinforce what the intelligent parent is doing for the child at home. In some cases the teacher will find that the home conditions do not provide facilities for the child



to carry on desirable health practices. In these cases the teacher must assume the additional responsibility of interpreting to the parents, in a sympathetic and understandable way, what the school hopes to do for their child.

For example, sleep is an essential factor in health and growth. The child in the junior grades requires twelve hours' sleep each night. While the primary responsibility for this rests on the home the teacher should help the child to establish good habits of sleep. A survey made by the teacher early in the term, the daily appraisal, and advice from the professional health services may reveal that some of the children are not securing sufficient sleep. In some homes the parents are aware of the amount of sleep needed and are trying to have the child secure the required number of hours under the best conditions. In other homes the parents are not informed or are neglectful of the child's sleep requirements. The first step in dealing with this problem is for the teacher to secure the sympathetic co-operation of the parents. The parents should be invited to visit the school when the children are engaged on an enterprise centred about a make-believe home which has been assembled on the sand-table. The conditions for sleep are worked out through the medium of a miniature bedroom which is quiet, has an open window, a bed with a hard mattress, a low pillow, and clean bedclothes. On the wall is a toy clock showing the time for retiring. A doll is used for a child and clean nightclothes are laid out on the bed; there is a chair on which to hang the day clothes, as these are taken off. These activities become real situations to the children and the parents see the relationship of the children's activities in the school to their daily lives at home. Thus the enterprise becomes a learning experience not only for the children but also for the parents.

The principles of healthful school living should be thoroughly understood by the teacher who should use them to appraise and determine all school activities and procedures. The school prepares the child for the larger world of adult life. The relationships of the home are personal; in his school life the child will experience for the first time those impersonal relationships which he will later find in his adult social contacts. The home has fostered feelings of self-confidence, adequacy, and security; these feelings are basic in the life of a mature adult. The school should strengthen these feelings, not disturb them. The atmosphere of the junior grades should ensure that all pupil-teacher relationships and all pupil associations should make it possible for the child to progress happily and without fear from family life to that larger and more detached life of the school.

Some activities and procedures with important health values are those relating to play and recreation, rest and relaxation, weighing and measuring, length and sequence of class-room assignments, motivation of pupil's work so as to avoid strain, anxiety, and pressure. The child should be given the responsibility and opportunity to make decisions affecting his personal life,

such as leaving the room to secure a drink or to go to the toilet; leaving his seat to sharpen a pencil or to secure a book. He should be encouraged to do these things without asking the permission of the teacher, and he should learn to conduct himself while doing them so that he does not disturb or interfere with other children in the room.

Throughout the day the teacher should give to each child commendation for work successfully performed. Every child should leave the school at the end of the day with a feeling that he has achieved some worth-while success. The memory of these successes will help him to face with confidence more difficult problems as these are encountered. The detention of children for the completion of unfinished work or for punishment is open to serious question. The teacher who helps the child to retain feelings of adequacy and confidence is preparing him to meet new situations fearlessly and to adapt himself without emotional disturbance to changes in his environment.

Health instruction should be carried on through units or enterprises and other activities requiring observation and creative effort. Doing by the children should take precedence over telling by the teacher. Teachers in the Province have reported that health instruction carried on through such activities creates a keen interest in practices related to the child's health and growth.

The child is interested in home and family life, pets, and plants. Teachers have taken advantage of these interests to provide experiences which have health values.

### UNITS, ENTERPRISES, AND OTHER ACTIVITIES

**Home and Family Life.** A house with living-room, bedroom, dining-room, kitchen, and bathroom was made by the pupils. Windows that would open were constructed; mats, rugs, furniture, bedclothes, and towels were designed and made. The pupils made dolls representing the father, the mother, and two children. This family required clothes for the various seasons; the children planned and made these. Necessary foods for health and growth were reproduced in various media. The pupils decided what should be provided in the way of facilities for sleep and play and worked these out in their handwork.

They took turns in being responsible for the daily life of the family and carried out the various health practices from the time they arose in the morning until they retired at night. The daily life of this family provided the children with many opportunities for building desirable health habits.

**Growing Things.** Bulbs, seeds, and slips were planted in pots and window-boxes. The children became responsible for the care of these and watched their growth. They found that growing plants need food, water, warmth, and sunshine.



Cocoons, goldfish, turtles, tadpoles, baby chicks, and rabbits were brought to the class-room and the children watched the growth of these. They cared for these under the direction of the teacher. They discovered that growing animals and growing plants require the same things as growing children.

**Farm Life.** In many schools a study of farm life was worked out on the sand-table or in a corner on the floor. The children made fields, wood-lot fences, lanes, running stream, well, and pump. They made reproductions of animals and their young. Some followed the daily-life habits of colts, others of calves, others of lambs, and others of chickens. They learned that all animals required food, water, sunshine, outdoor activity, rest and sleep. With the coming of cold weather the children decided to make warm houses for their animals. They built stables and barns, making sure that these had plenty of air and light. Interest was aroused in the things that grow in the field, in the garden, and in the orchard. They learned that food, water, and sunshine were necessary for the growth of vegetables, fruits, and trees. They harvested and stored foods. This gave the teacher simple situations through which he could relate the products of the fields, garden, and orchard to the food requirements of the growing child.

**Projects.** Each child reproduced in various media his own toothbrush, washcloth, towel, and other toilet articles. These were assembled and taken home.

**Charts.** Children prepared individual charts based on the specific health habit receiving emphasis at the time. These were taken home to be checked by the parents, and proved a practical method of securing their interest and co-operation. In some cases parents reported that the work of the school re-enforced the efforts of the home and effected a noticeable improvement in habits of sleep, cleanliness, eating, etc. For children in these grades any health chart should not be continued for more than one or two weeks at a time.

The child's habits are in process of formation and throughout the year the teacher should give attention to those practices which have a direct bearing upon his health and growth. There will be a difference in emphasis on the various habits for each child. Each year the teacher will find that the needs of the class will influence him in deciding the amount of time to be spent on the various health practices. If health instruction is to have real value it must not become formal or standardized, nor must it lose contact with the actual needs of the individual child.

It is not recommended that the teacher should provide a definite period on the time-table for health instruction in these grades. The discerning and informed teacher will find innumerable opportunities throughout the school day to relate health to the various school activities of the children.

Motivation of the work in these grades will come through the child's

interest in his growth. Weighing and measuring should be part of the teacher's activities to motivate the work of the children and to arouse their interest in those practices which contribute to their health and growth. Each child should be weighed once a month and he should be encouraged to make and keep a chart to record his weight. He should be measured three times in the school year. His height should be recorded on his height chart.

Tables of so-called average weight for height and age are not applicable for class-room use and should not be used. There are many factors concerned in the nutritional status of a child. If he loses in weight or if his weight is stationary over a period of three months the teacher should advise the parent, who in turn should consult a physician.

Health habits for the primary child are listed below. The organization shows the activities of the children and the information the teacher should possess. The order in which these topics appear is in no way significant of their relative importance. The outline includes the sum total of the instruction for all classes from Kindergarten to Grade II, inclusive. The choice of the particular items to be covered in each grade is left to the judgment of the teacher. No attempt, however, should be made to cover the whole amount in any one year.

## CLEANLINESS

### What the Child Should Do

Come to school neat and clean.

Wash his hands, face, neck, and ears with warm water and soap at least once a day.

Brush his teeth and gums night and morning.

Wash his hands before handling food.

Wash and dry his hands properly to prevent them from chapping.

Use his own towel, wash cloth, comb, and brush.

Wash his feet frequently.

Change his stockings at least twice a week.

Keep his shoes clean and polished.

Keep his nails clean and refrain from biting them.

Trim his nails and file them.

Have a full bath more than once a week.

Have a bowel movement every day.

Use the toilet properly.

Wash his hands after going to the toilet.

Use an individual drinking-cup or use the drinking fountain without touching the bubbler with his lips.

### Information for the Teacher

Children must be taught cleanliness. Infants and little children cannot keep themselves clean but depend upon others. The ability to clean one's teeth, face, and hands, and to keep one's clothing clean is indicative of growing up. The teacher should show the child how to wash his face and hands. The child learns by doing.

A simple and inexpensive outfit for hand-washing should be provided for the children's use after going to the toilet and before touching food.

Internal cleanliness is important as it directly influences health; for this reason a daily bowel movement is necessary.

The child coming to school for the first time is in a strange environment. The teacher should take him to the toilet and show him how this is used and where and how to wash his hands afterwards. Toilet periods should be provided on the daily programme for both morning and afternoon sessions. These are in addition to the regular recess periods. The children should know that they are free to go to the toilet whenever necessary.



### What the Child Should Do

Avoid handling books, pencils, or other belongings of others.

Keep his work books clean and neat.

Keep his desk clean and neat.

Put away his work and play material in their proper places.

### What the Child Should Know

How to get ready for school.

How to wash his hands, face, neck, and ears.

How to clean and file his nails.

That he should have a full bath more than once a week.

That he must have a bowel movement every day.

That he should have his own towel, wash cloth, comb, and brush.

### Information for the Teacher

and that this can be done without asking permission to leave the room.

The teacher should inspect the toilets daily to see that they are in sanitary condition and free from writing or markings detrimental to the moral health of the children.

Preparation of the child for school includes brushing teeth, washing face, neck, ears, and hands; cleaning nails; brushing hair; going to the toilet; having a clean handkerchief. A supply of paper handkerchiefs should be available in every class-room.

A mirror in the cloak-room hung so that the children may see themselves is a means of developing cleanliness and a regard for personal appearance.

Both at home and at school the child should use an individual towel and should have his own toilet articles for which he may make or decorate a container.

## CLOTHING

### What the Child Should Do

Keep his clothing clean and neat to the best of his ability.

Dress according to the weather.

Remove all wraps, rubbers, and outdoor clothing when indoors and hang them up to keep them clean.

Remove any damp clothing when he comes into the school.

### What the Child Should Know

How to remove his own rubbers and wraps.

How to put on his own rubbers and wraps.

That all damp clothing should be removed when he comes into the school.

### Information for the Teacher

Physical discomfort is a cause of restlessness and inattention. Wearing outdoor wraps, heavy sweaters, rubbers, and overshoes in the class-room tends to make a child uncomfortably hot. The removal of outdoor clothing, including rubbers and goloshes, is imperative. The child must have a place of his own where he may hang his clothes. Hangers for wraps should be provided. These not only help the child to keep his clothes neat but are most useful in the drying of wet clothes. Hangers may be brought from home. In many schools they are being made for the young children by the pupils of the senior classes.

Damp clothing, shoes, and stockings should be removed and hung up to dry.

In learning to put on and to remove his own wraps and to hang these in their proper place, the child becomes interested in the care and neatness of his clothing.

## COLD PREVENTION

## What the Child Should Do

Sit in his own seat.

Keep his hands and pencils out of his mouth.

Bring a clean handkerchief every day and use it when necessary.

Cover his nose and mouth with a handkerchief when coughing or sneezing.

Remain at home when he has a cold.

## What the Child Should Know

That he may give a cold to others.

That he should keep away from a child who has a cold.

How to use a handkerchief.

## Information for the Teacher

Colds are responsible for the greatest loss of time from school. Measures to reduce this loss are of vital importance to teachers, parents, and school authorities. For his own sake and because of other pupils the child with a cold should not be in school. By explaining this to the parents the teacher will secure their co-operation in this measure of cold prevention.

Coughing and sneezing in school without covering nose and mouth with a clean handkerchief may contribute to the spread of colds. The teacher, therefore, should make it a point to instruct the child in the use of the handkerchief.

Other measures in cold prevention are: seating the children in single seats and the removal of wet or damp clothing, heavy sweaters, and goloshes. Children in Ontario should take cod liver oil from October to May.

Where such preventive measures have been followed, it has been found that the loss of time due to colds has been greatly reduced.

## SAFETY

## What the Child Should Do

Cross the road carefully.

Face oncoming traffic when walking on the road.

Avoid playing with fire.

Play in safe places.

Be careful in the use of scissors and other sharp utensils.

## What the Child Should Know

His own name, name of his father, and his home address.

How to cross the road safely.

That an adult should be called in case of accident.

## Information for the Teacher

The high accident rate among very young children makes it necessary to instruct the child in safety measures and to give him opportunity for practising care in daily life situations.

To cross the road carefully means: to look first to the left; then to look to the right; then to *walk carefully* across to the other side. When walking along a country road, children should face oncoming traffic.

A street or highway is not a safe playing place for children. The only effective safety measure for play is to provide adequate recreation and play areas which are free from hazard.

Children should be instructed in the use and handling of scissors and other primary materials.

The teacher should use the fire drill as an occasion for teaching the child to walk out of the school without fear or excitement. The fire drill may also be used as an approach for instruction in safety measures in the case of fires of all kinds.



## EYES

### What the Child Should Do

Have the light fall over his left shoulder when he is using his eyes.

Go to his parents or his teacher if he gets a foreign object in his eyes.

Refrain from rubbing his eyes.

If he has to wear glasses, wear them as prescribed by the physician.

### Information for the Teacher

In the primary grades special attention should be given to the eyes of the children. Studies made in Ontario indicate an increasing number of vision defects during the first two years in school. The teacher can do much to protect the eyes of the pupils by arranging the seats to meet the vision needs of the individual child and by adjusting the lighting so as to provide a maximum amount of light and freedom from glare.

It is important that the teacher give special attention to all writing on the blackboard. The letters and figures should be large, well-spaced, and readable without strain by all pupils. Since writing by children does not meet these requirements all blackboard work to be read by the children should be written by the teacher.

## AIR AND SUNSHINE

### What the Child Should Do

Play in the sunshine whenever possible.

Play out-of-doors every day.

### What the Child Should Know

That there should be sunshine in the class-room.

That sunshine helps him to grow.

That cool moving air makes him feel comfortable.

### Information for the Teacher

Sunshine helps the child to grow. The teacher should arrange to have as much sunshine as possible in the class-room. The blinds should be drawn only to regulate glare and to prevent direct sunlight from striking the children's eyes. Rather than draw the blinds and decrease the amount of light in the class-room, individual children should move their seats. Blinds should be adjusted from time to time during the day so that a maximum of sunshine is assured.

Children should play in the fresh air at recess, noon, and after school. Playing out-of-doors should never be cut short by detentions.

From October to May in this Province sunshine is lacking in certain elements essential for growth. These are found in cod liver oil, which the child should be encouraged to take during the winter months.

By opening the windows, the cool moving air necessary for the well-being and comfort of both teacher and pupils may be provided. Draughts, however, should be avoided.

## PLAY AND RECREATION

**What the Child Should Do**

Sit, stand, and walk with ease and comfort.

Play active games every day.

Play harmoniously with other children.

When warm after playing put on coat or sweater to prevent chilling.

**What the Child Should Know**

That games are more enjoyable when the players take turns.

How to play.

**Information for the Teacher**

Play and recreation contribute to the physical, mental, emotional, and social life of the child. The teacher in these grades should, therefore, provide short periods in both morning and afternoon sessions for the teaching of games in keeping with the age level of the children.

Play is based on the child's inherent interests—running, jumping, climbing, and throwing. Every child should participate in the play activities except where a physician has recommended otherwise.

The child who is somewhat timid when first faced with groups of other children does not present a serious problem as this timidity will disappear after a few days at school. But the child who persistently withdraws from play requires careful consideration by the teacher. His inability to adapt himself to playing with others may be due to fear, or to his home training or to lack of opportunity. Through play he may be led to overcome his timidity. Play presents opportunities for self-expression and for normal conduct in the presence of others and helps the child to gain control of his body.

If the child shows disinclination to play the teacher should guard against forcing, ridiculing, or urging him to do so. There are some basic reasons for his withdrawal from play with other children. The intelligent teacher will try to ascertain these reasons and to lead the child to participate in games where he will achieve success. Satisfactions are the best motives to induce the timid child to seek further play experiences with other children.

## REST AND SLEEP

**What the Child Should Do**

Sleep twelve hours every night.

Prepare himself for bed.

Rest during rest periods in school.

**What the Child Should Know**

How to prepare for bed.

What time to go to bed.

How to rest.

**Information for the Teacher**

Starting to school is a radical change for the child. At home he played when he felt like it and rested when he was tired. To sit still in his seat for a long period and to engage in class-room activities cause fatigue, the outer manifestations of which may be restlessness and irritability. These conditions are matters of health rather than of discipline.



### Information for the Teacher

In these grades a definite rest period of ten minutes' duration should be planned both in the morning and in the afternoon. The children should lie down. Newspaper, brown paper, or little mats are used to protect the clothing if the children lie on the floor. The child should relax completely. If a child shows evidence of weariness he should be allowed to rest and should not be disturbed by the teacher or by other pupils.

Every child needs regular and adequate sleep, at this age twelve hours each night. Much of the restlessness and lack of attention in class may be traced to insufficient sleep. Although the home is primarily responsible, the teacher can do much to re-enforce the mother's efforts, and the child should soon begin to assume some responsibility for going to bed at a definite hour.

Preparation for bed includes: removal of all day clothing; hanging it up to air; putting on clean night-clothes; going to the toilet; brushing the teeth; washing the face, neck, ears, and hands; opening the window.

## FOOD

### What the Child Should Do

- Wash his hands before eating.
- Sit down while eating; eat slowly; and chew food thoroughly.
- Eat three meals every day at regular times.
- Rest, or play quiet games after meals.
- Drink some milk and eat some fruit and vegetables every day.
- Eat a good breakfast every day.
- Eat fruit rather than candy.
- Drink plenty of water every day.
- Wash raw fruits and vegetables before eating them.
- Avoid eating foods which have been dropped on the floor, ground, or street.
- Avoid eating foods which have been put to the mouth of another.

### What the Child Should Know

- Good practices in eating.
- That he should have some milk, fruit, and green vegetables every day.
- What makes a good breakfast.

### Information for the Teacher

For his growth, which at this age is very rapid, a child needs milk, fruit, and vegetables in his daily diet. The mid-morning lunch period and the noon lunch will provide opportunities for inculcating good practices in eating.

It is very important that the child develop the habit of eating a good breakfast each morning. The attention of the teacher in these grades should, therefore, be centred on the morning meal.

A good breakfast consists of cereal with milk; bread or toast with butter; fruit, raw or cooked; milk, or cocoa. One or two slices of well-cooked bacon or one egg may be added in the winter months.

## TEETH

## What the Child Should Do

Brush his teeth and gums night and morning.

Use and care for his own tooth brush.

Eat every day some foods which help to build strong teeth.

Eat every day some coarse foods.

## What the Child Should Know

How to brush the teeth and gums.

That he should have his own tooth brush.

That milk, fresh fruit, and green vegetables help to build strong teeth.

That cod liver oil helps to build strong teeth.

That he should go to the dentist at least twice a year.

That he has the first four teeth of his secondary set, where to find them, and how to care for them.

## Information for the Teacher

Between the ages of five and seven years four new teeth appear in the child's mouth. They are the first of his secondary teeth. Since they mark the fact that he is growing up, the child is interested in their location and appearance. By using a pocket mirror and counting from the front centre space he can identify them as the sixth tooth to the right and to the left in both upper and lower jaws. The child is accustomed to losing his first teeth one by one, but is impressed by the fact that these four new teeth are come to stay. They require his special care. If he should lose them, others will not grow to take their places.

To help build strong teeth-supporting structures the child should include in his daily diet milk, fresh fruits, and vegetables. Sunshine and cod liver oil are also essential.

Brushing the teeth is related to cleanliness. The child should know how to use the brush correctly. The upper teeth should be brushed down; the lower teeth should be brushed up; the grinding surfaces of the teeth should be brushed; the tongue and the tongue-side of the teeth should be brushed.

Some coarse foods should be eaten every day. They make chewing necessary, exercise the gums and teeth, and help to keep them clean and healthy.

The child should be led to understand that the dentist is a friend who will help him to keep his teeth strong and healthy. The years from six to eight are a very important period in the development of the child's teeth. All children require supervision by the dentist three times a year. Some will require inspection more frequently than others.

## References for the Teacher:

- Beauchamp and West: *Science for Children*. Scott, Foresman, 1935. (Gage, Toronto.)  
 Chesterman, Linda: *Activities and Songs*. Harrap, London, 1937. (Clarke, Irwin, Toronto.)  
 Chesterman, Linda: *Six Little Plays and Ten Dances*. Harrap, 1937. (Clarke, Irwin, Toronto.)  
 Davies and Storr: *Con Moto Rhythmic Series*. Book I—Infant School. Music in separate volume. University of London Press, 1937. (Clarke, Irwin, Toronto.)  
 Foster and Headley: *Education in the Kindergarten*. American Book Co., 1936. (Gage, Toronto.)  
 Grant, J. A.: *The Doll's House*. Studio Publications, London, 1934. (Clarke, Irwin, Toronto.)



- Heaton, H. M.: *Home Training for Young Children*. Pitman, Toronto, 1937.
- Holmes and Davies: *Organized Play in the Infant and Nursery School*; with music. University of London Press, 1937. (Clarke Irwin, Toronto.)
- McConathy, Miessner, Birge and Bray: *The Music Hour in the Kindergarten and First Grade*. Silver, Burdett and Co. 1929. (Gage, Toronto.)
- Polkinghorne, R. H. and M. I. R.: *Toy-making in School and Home*. Harrap, London, 1937. (Clarke, Irwin, Toronto.)
- Thorburn, May: *Toy Making from Odds and Ends*. Charles, London, 1930. (Clarke, Irwin, Toronto.)
- Warren, Winifred I.: *Ten Easy Dances for Infants' Schools*. University of London Press, London, 1937. (Clarke, Irwin, Toronto.)

**References for the Pupils:**

- Andress, Andress, and Dickson: *Summer Fun*. Ginn, Montreal, 1932.
- Beauchamp, Crampton and Gray: *Science Stories*. Book One. Gage, Toronto, 1933.
- Charters, Smiley, and Strang: *From Morning Till Night*. Macmillan, Toronto, 1936.
- Charters, Smiley, and Strang: *Happy Days*. Macmillan, Toronto, 1936.
- Persing and Peeples: *Elementary Science by Grades*. Book One. Appleton-Century, 1935. (Ryerson, Toronto.)
- Phair, Power and Roberts: *The Joy Family*. Copp, Clark, Toronto, 1937.
- Towse and Gray: *Health Stories*. Book One. Gage, Toronto, 1933.

## CHAPTER XIV

### HEALTH INSTRUCTION IN GRADES III AND IV

Before beginning the work of these grades teachers are advised to read carefully the outline prepared for Grades I and II. Modern health education is based upon the recognition of the developing life of the child. Unfortunately the weakness of health instruction in the past has been due to the failure of the teachers to recognize the necessity of grading materials and presentation in keeping with child growth. The child who has been in school two years is naturally not interested in those things which held his attention when he began school. The teacher cannot hope to maintain his interest in health practices unless these are presented to him through new approaches which are in harmony with his developing life.

Early in the term the teacher should secure information relating to the health status and practices of each child. He has acquired many desirable health habits before entering Grade III. These should emerge as definite habits while the child is in Grades III and IV. There should be no attempt on the part of the teacher to make the child health conscious, but the teacher should recognize the importance of relating the health instruction in these grades to the individual needs of the children.

Home co-operation continues to be essential and the teacher should know the home background and opportunities of each child. This co-operation will be constructive and intelligent if the teacher interprets to the parents, not merely by telling, but also by having them observe in the school, pupil activities which demonstrate the purpose of the teacher's work in terms of the health behaviour of the child.

The child begins to realize that growing up means a capacity to do things for himself, and this will imply a larger measure of responsibility in the conduct of his daily life. He becomes explorative; he tests out his ability to do things that other children do and at times he recognizes his inability and is confronted with his limitations.

The main objective of health education in these grades is the acquisition of desirable health habits by the child. He is now assuming some measure of responsibility for his own actions and he will be interested in knowing how to do those things which will help him to grow. He begins to ask questions respecting certain aspects of his health behaviour and the teacher should be prepared to answer these in terms the child can understand. He observes growing plants and growing animals as well as growing boys and girls. He will, therefore, understand the answers to his questions if these answers are given in terms of growth. The emphasis in these grades should be on the



various techniques of doing which can be used to arouse and sustain interest. If health education is to have meaning in the life of the child it must come to him through life situations in the home, in the class-room, on the playground, and in his social contacts with others.

The principles of healthful school living should be thoroughly understood by the teacher and should be used by him to appraise and determine the activities and procedures of the class-room. The school is preparing the child for the larger world of adult life. The relationships of the home are personal. In the school the child should learn to establish those impersonal relationships which he will find in his adult social contacts. The home has fostered feelings of self-confidence, adequacy, and security. In the primary grades these feelings have been strengthened. They are basic in the life of a mature adult, and the school should do nothing to disturb or interrupt their development. The teacher in these grades should make every effort to provide an atmosphere in the class-room and on the playground which will make it possible for the child to live happily and without fear in the school community. There should be nothing which will disturb him or cause him anxiety in his relationships with the teacher and with other children in the school.

Throughout the day each child should be commended for successful work accomplished. He should leave school at the end of the day with a feeling that he has achieved something worth while. This will give him confidence which will enable him to deal with more difficult problems as they arise. The teacher should foster feelings of adequacy and confidence in the child, for in so doing he is preparing the child to meet new situations fearlessly and to adapt himself without emotional disturbances to a changing social environment. Detention at recess, at the noon-hour, or after school to complete work or as a punishment tends to upset the child's self-confidence and may have serious after effects in his life. The opening and closing exercises, if organized so that each child is encouraged to participate, offer excellent opportunities for the informed and understanding teacher to contribute to the child's emotional and social health.

In these grades the teacher should recognize the important part which certain school activities play in promoting the health of the school child. The play and recreational periods have not only values in providing a child with physical activity but, perhaps more important still, they contribute to his mental and social health. The children in these grades require rest and relaxation. Care should, therefore, be taken to ensure that class-room assignments are not too long and that the sequence is such that the child is not kept for protracted periods at related types of class-room learning. Weighing and measuring will have a new interest to the child in these grades, since he himself will assume some responsibility in these activities.

The child should be given increased responsibility and opportunities to make decisions affecting his personal life. He should be free to leave the

room to secure a drink or to go to the toilet. He should not have to ask permission either to sharpen his pencil or to secure a book from the book-shelf or library. He should, however, learn to perform these personal activities without disturbing or interfering with the other children in the room. The teacher should so direct the activities of the class-room that there will be no strain, anxiety, or pressure. The child should be led to secure satisfaction in competing against his past achievements rather than against those of other children.

The teacher should make a daily health and cleanliness appraisal of each child. Informal assembly of the children makes it possible to combine the morning greeting with this appraisal. The teacher should never assign to any child a part in the health and cleanliness inspection of another. This daily appraisal provides the teacher with an opportunity of ascertaining the health conditions of each child before the regular work of the class-room is begun. It should be a guide to the teacher in the organization and direction of school activities throughout the day.

### UNITS OR ENTERPRISES, AND OTHER ACTIVITIES

Health instruction should be carried on through units or enterprises and through other activities. These should provide opportunities for every child to plan, to construct, to observe, and to evaluate his own efforts. They should be on the grade level of the child. In the development of habits, doing by the children is more important than is telling by the teacher. Teachers of these grades who have employed such methods have reported a keen interest on the part of the children and a marked improvement in those practices related to their health and growth. In the primary grades health instruction has been related to home and family life and the child's interest in pets and plants. The child in Grades III and IV is interested in a larger world and this interest is directed towards the lives of other people in the community, the childhood of his parents, and the children of pioneer days. As he grows older he becomes interested in the children of other lands. Many teachers have taken advantage of these new interests to provide experiences with real life situations which will contribute to the child's health behaviour.

**Pioneer Life.** An arrowhead turned up by the plough, a picture of a log cabin, or some old household article brought to school by the pupils opened a discussion and led to an expressed desire by the children to know more about what people did many years ago. Under the direction of one teacher this interest developed into a unit on pioneer life. The forest setting was arranged on a sand-table and illustrated the various land forms to be studied in the geography of Grade IV. A clearing in the forest was made and a log cabin designed and built for the family. Shelters for the cattle, horses, pigs, sheep, etc., were designed and made. A study of the life of the people of the settlement introduced such interesting topics as: fishing, hunting, picking of wild



fruits, etc. In the spring sugar-making was used as a project, the shanty, the fire, and the utensils for collecting and sugaring-off all being made by the children. Projects on honey, gathering of nuts, and drying of fruits for winter use were introduced into the study during the autumn. Seasonal activities produced grain fields, vegetable garden, flower-beds near the cabin, sowing of grain, harvesting, corn husking, etc.

The water supply presented no serious problem to the pioneers if a stream were available. However, as settlers upstream increased in number, the water became unsafe and a well was necessary. The children made a pump. Other interesting studies were: the making of candles and soap; spinning wool and weaving materials for clothing; grinding of grain; trading at the general store; making butter and cheese, etc.

Inquiries about the first church and the first school led to a discussion of social activities. The children made a small log church and log school-house. Seasonal sports created great interest also. The games, music, and songs of the pioneers were learned, and the children introduced those they liked into their free-play and singing periods. Quilting, paring and husking bees, sheep-shearing, cutting firewood, soap-making, and sugaring-off, provided additional interesting studies. The Indian settlement near by became a colourful project within the unit, since it was related to the life of the pioneers. The child discovered that certain practices of the pioneers had a definite relation to health and he was led to see the connection between their practices and those of his own daily life.

**Store.** Variations of the popular grocery-store unit have also provided purposeful pupil activities. The children made their own currency; planned the location, size, construction, and colour of the store; and secured the stock from various sources. The unit was used in considering the buying of foods to make one grow. In one class the idea was enlarged to a unit on a general store, and the children worked out activities related to food, clothing, and cleanliness. The telephone conversation between a mother and the storekeeper became a real situation involving training in language.

**Community Life.** The interest of the child in social studies was used to study community life. The situation of his home in respect to the school, to the church, to the store, and to other places was noted. He learned how to draw a map and drew maps of the school room, school yard, home, and of roads leading to the school, to the store, etc. The children built a sand-table project representing the community in which they lived, showing the school, the home, the church, the roads, etc. As this was built up, reference was made to such health topics as safety on highways and streets, lighting of homes, schools, churches, and streets; water-supply for the homes and schools; toilet facilities; gardens, orchards, and fields, which produce food materials.

**Child Life in Other Lands.** Other aspects of social studies involved the situations having health significance and values. One unit was worked out on child life in present-day China. The children found from books, from talking to people, and from a visit to a museum many things about the life of Chinese children. These included the house in which the Chinese child lives (how it is built; its doors and windows; how it is kept warm in winter; how the sleeping rooms are furnished; how the rest of the house is furnished and kept clean); the food of the Chinese child (how the mother prepares this food; what dishes are used and how these are kept clean; eating habits); Chinese clothing (summer and winter clothing; shoes; how these are kept clean); a Chinese school (books and writing materials; going to school; games played at school); pets and animals in a Chinese home; a visit to a Chinese city or village; Chinese money. The pupils wrote and acted a little Chinese play after they had read a story of Chinese life. They constructed a Chinese village on the sand-table. They made models of houses, streets, shops, schools, temples, etc. They played Chinese games and dramatized incidents in the daily life of Chinese children. They also planned how they would spend a day if they lived in China. The importance of this unit in health instruction was the relationship developed between the child's own life and the life of a Chinese child.

Similar studies of child life in other countries have been successfully worked out by other classes.

**Habit Charts.** Individual habit charts relating to the specific health topic being emphasized at the time were prepared by the children in class. For example, when food for growth and health was being considered, a breakfast chart was prepared by each child and this chart was checked over a period of not less than one and not more than two weeks. The child noted on it the food he ate for breakfast each day. The teacher observed what each child was having for breakfast but in no case was there any discussion in class of the breakfast of any child. At the end of the period the child took the chart home to show his parents. Similar charts were prepared for other health topics.

## HEALTH PRACTICES

Health habits for the child in Grades III and IV are listed below. New practices are introduced and others to which attention has already been given in primary grades are included. In the latter, new approaches should be used to arouse the interest of the child. In order that the activities may have a valuable health significance to the child the arrangement shows the activities of the children and the information which the teacher should possess. The order in which these appear is in no way significant of their relative importance or sequence. The child's habits are in process of formation throughout the



year and the teacher should at all times stress those practices which have a direct bearing upon his health and growth.

The special emphasis on health habits will vary with each child. Each year the teacher will find that the needs of the class will influence him in deciding the time to be spent on each of these habits. If health instruction is to have real value in the life of the child it must not become formal, it must not become standardized, nor must it lose contact with the actual needs of the individual child.

At least two definite periods of fifteen minutes each week should be reserved for health instruction in these grades. This will be in addition to the activity periods carried on by the pupils in enterprises and units. The discerning and informed teacher will find innumerable opportunities throughout the school day to relate health to the various school activities.

## CLEANLINESS

### (a) PERSONAL CLEANLINESS

#### What the Child Should Do

- Come to school clean and neat.
- Wash his face, neck, ears, and feet with warm water and soap at least once a day.
- Brush his teeth night and morning.
- Use his own towel and wash cloth.
- Wash and dry his hands thoroughly to prevent them from chapping.
- Keep his finger nails clean and trimmed.
- Refrain from biting his nails.
- Have a full bath more than once a week.
- Comb and brush his hair at least once a day.
- Wash his hair at least once in two weeks.
- Use his own comb and brush and keep them clean.
- Go to the toilet every day.
- Wash hands after using the toilet.

#### What the Child Should Know

- How to get ready for school.
- How to maintain cleanliness of face, neck, ears, hands, feet, nails, hair, and body.
- That he should have his own towel, wash-cloth, comb, and brush.
- That he should have a bowel movement every day.
- That it is not disgraceful to have pediculosis but that it is a disgrace to allow the condition to persist.

#### Information for the Teacher

The child at this age may be held responsible for his personal cleanliness. The teacher should make sure that he knows how to wash and get ready for school. As in the preceding grades, the teacher will find that an appeal to the desire to grow up will be a help in dealing with those children who have not yet developed cleanliness habits. Children should wash their hands after going to the toilet and before eating. Adequate facilities for hand-washing should be provided in all schools.

The child should learn that to get ready for school means: to brush his teeth; to wash his face, neck, ears, and hands; to comb and brush his hair; to clean his finger nails; to clean his shoes; to brush his clothes; to eat a good breakfast; to go to the toilet; to get a clean handkerchief; and to dress suitably for the weather.

Individual toilet articles for his exclusive personal use at school and at home are essential if the child is to practise cleanliness and protect himself from infections, including those of the skin.

The teacher will find it advisable to keep a supply of paper handkerchiefs in the class-room.

A mirror in the cloak-room or the class-room, placed so that the children may see themselves, is an effective means of developing habits of cleanli-

### Information for the Teacher

ness and a regard for personal appearance.

Any child or adult may become infected with pediculosis. The child at this age should know that pediculosis will clear very quickly if given prompt and proper treatment. Tactful handling by the teacher and the fact that simple treatment will overcome the condition in a very short time will prevent embarrassment of a child and his ostracism by the other pupils.

## (b) CLEANLINESS OF ENVIRONMENT

### What the Child Should Do

Help keep the school grounds clean and in order.

Help keep corridors and basements clean.

Help keep the toilets and hand-washing facilities clean.

Help keep the class-room clean and neat.

Help keep the cloak-rooms clean.

Keep own desk and floor near seat clean and neat.

Keep work-books clean and neat.

### What the Child Should Know

How he may help to keep the school environment clean and orderly.

### Information for the Teacher

The condition of the child's environment will influence his attitudes with respect to his personal cleanliness, as well as to the cleanliness of his surroundings. The teacher will recall from an earlier section of the Handbook that the standards of cleanliness in the school and the class-room are determined by the co-operation of the pupils, the teacher, and the caretaker. The teacher should regard it as part of the health instruction in this grade to lead the children to see how they may contribute to the maintenance of clean and healthful school surroundings. Beginning with the class-room, the child should care for his own desk and seat and the floor surrounding them; then he should know that the cleanliness of the cloak-rooms and corridors requires his co-operation. The basements, play-rooms, toilets, and wash-room facilities cannot be kept in a sanitary condition unless each child uses these with care and with due regard for cleanliness. Cleanliness of person and surroundings has an important influence upon the social health and well-being of the individual, and early in his school life the child should learn that cleanliness helps him to make and to keep friends and to gain the esteem and regard of others. Orderliness is an aspect of cleanliness that should not be overlooked and it is in the early periods of the child's life that he will learn to keep in order not only his personal possessions but also the class-room and other parts of the school environment.



### Information for the Teacher

The toilet facilities in the school should be regarded by the teacher in the same light as he would regard the bathroom in his own home. By personal daily inspection he should make sure that the toilets are sanitary and that no offensive writing or markings are in evidence.

He should also make sure that the water supply for both drinking and washing is adequate and in good order. There should be a sufficient flow of water in all sanitary drinking fountains to ensure that all children are able to secure a drink without touching the lips to the drinking fountain.

## FEET

### What the Child Should Do

Wash his feet every night.  
Keep his toe-nails short and clean.  
Change his stockings at least twice a week.  
Wear stockings that fit his feet.  
Keep shoes clean and polished.  
Wear shoes that fit his feet.

### What the Child Should Know

That the feet require special care.  
How to care for the feet.

### Information for the Teacher

Care of the feet in childhood is most important as pressure may result in malformation. Foundation for foot comfort in adult life is laid during the formative years. Care of the feet includes: washing the feet every night with careful drying of the skin between the toes; frequent paring and cleaning of the toe-nails. Since the stockings absorb the perspiration from the feet, these should be changed frequently—at least twice a week. While it is imperative that the shoe and the stocking should be longer and wider than the child's foot, they should not be oversized and should give support.

## EARS AND NOSE

### What the Child Should Do

Care for his ears.  
Care for his nose.  
Blow his nose gently.  
Breathe with mouth closed.

### What the Child Should Know

How to care for his ears.  
How to care for his nose.

### Information for the Teacher

*Ears.* Hearing is one of our most valuable possessions and should be safeguarded with the greatest care. Injuries to the outer ear may affect the hearing. The hearing part of the ear may be injured by shouting into the ear or by hitting or pulling it. Nothing should be put into the ear except when the ear is being cleaned and then nothing smaller than the little finger should be used. After bathing and swimming all water should be removed from the ear.

### Information for the Teacher

*Nose.* The nose has small hairs and a special lining which sifts the dirt out of the air. Wiping the inside of the nose after a ride on the train or a walk on a dusty road or sweeping a dusty room will show how good a sieve the nose is and how much dirt it keeps from the lungs. For this reason one should always breathe through the nose. Care in blowing the nose is essential. Use only a clean handkerchief, either cloth or paper.

## EYES

### What the Child Should Do

Sit so that he will not be reading or writing in his own shadow.

Read only in a good light and hold reading matter in the correct position and at proper distance from the eyes.

Wear glasses at all times, if these are prescribed by the physician.

Avoid doing anything that might cause injury to his own eyes or the eyes of another.

Refrain from looking directly at the sun or at extremely bright lights.

### What the Child Should Know

How to care for his eyes.

### Information for the Teacher

Normal vision, whether natural or adjusted by glasses, should be cared for and safeguarded. In work and in play the child of this age should exercise great care in using playthings and tools. He should protect his eyes from the sun, from glare, and from extremely bright lights. In the class-room the child should rest his eyes frequently. This may be done by closing them or looking out of the window at distant objects.

Children should now begin to participate in the regulation of the lighting of the class-room. They should know that a maximum of light is desirable. All children should be protected against direct sunlight and glare. If, however, sunlight or glare is affecting only a few children in a class-room, these children should change their seats rather than have the light from the class-room cut off by drawn blinds. Children should be free to move their seats out of the direct sunlight or when the light is insufficient. Children should know the value of artificial lighting in the class-room. The teacher should know that insufficient lighting in the class-room is a serious hazard to vision, and that the needs of the children should determine if the natural lighting should be supplemented by electric lights.

The child should know that the light should fall over the left shoulder and that the book or other reading matter should be held about fourteen inches from his eyes.

The teacher should give special attention to all blackboard writing, making



### Information for the Teacher

sure that the letters and figures are large, well-spaced, and easily read by all without strain. A child's writing on the blackboard does not meet these requirements. It follows, therefore, that all blackboard writing to be read by the children should be done by the teacher.

Rubbing the eye is harmful since foreign matter in the eye may become imbedded in the eye-ball or the eye-lid; closing the eye will often allow the tears to wash such matter to the corner of the eye. If the foreign object is not washed out in a short time, the child should go to an adult for help.

Protecting the eyes from infection is most important and for this reason each pupil should have his own towel and wash-cloth, both at home and at school.

## COLD PREVENTION

### What the Child Should Do

Sit in his own seat.

Follow good health practices and avoid over-fatigue and chills.

Avoid contact with people with colds both at home and at school.

Remain at home when suffering from a cold, and have it treated promptly.

Use an individual drinking cup; use a drinking fountain without touching the bubbler with lips.

Keep his hands, pencils, books, and other materials from contact with the nose and mouth.

Use only his own handkerchief.

Cover his mouth and nose with a clean handkerchief when coughing or sneezing.

Bring a clean handkerchief to school every day and use it when necessary.

### What the Child Should Know

That a cold is spread from person to person.

That a healthy body will help protect him from colds.

### Information for the Teacher

The three most important points in cold prevention are: keeping the general health in good condition by getting plenty of good food, sleep, and sunshine; avoiding infection from people suffering from colds; avoiding fatigue and chills.

A teacher or pupil who has an incipient cold should remain at home, for early treatment will often check a cold completely. A neglected cold often results in protracted absence from school and the spread of colds throughout the school. Teachers and pupils may rightly demand that their rights be respected by others in the matter of protection from cold infection. Children should be encouraged to take cod liver oil from October to May.

If one has a cold one should keep warm, follow a simple diet, drink quantities of liquids, secure proper elimination of wastes from the body, go to bed as soon as possible and stay there until better. If the cold does not clear quickly, a doctor should be consulted.

From October to the beginning of May teachers and pupils are more than usually subject to colds. The matter of cold prevention should consequently receive especial attention in the class-room throughout these months.

## CLOTHING

## What the Child Should Do

Have clothing clean and neat, according to his ability and circumstances.

Adapt the amount and kind of clothing to the weather and the temperature.

Remove extra wraps, sweaters, and rubbers when indoors and put these in their proper places.

Refrain from getting his clothing wet and remove damp clothing as soon as possible after his arrival at school or at his home.

Change underwear twice a week.

## What the Child Should Know

How to adapt his clothing to weather conditions.

That his sweater, wraps, and rubbers should be removed when indoors.

How to adapt his clothing for comfort.

That he should change his underwear twice a week.

That all damp clothing should be removed promptly when he comes in from outside.

## Information for the Teacher

The parents supply the child's clothing but, in keeping with his development, the child himself should be given a measure of responsibility for the selection, amount, and kind of clothing he should wear to suit weather conditions.

He should remove and take pride in caring for his outdoor wraps, head covering, rubbers, and overshoes.

He should hang up wet clothing to dry.

He should either bring a hanger from home or make one for use in school.

The teacher is referred to the section on clothing included under Grades I and II.

## FOOD

## What the Child Should Do

Have a varied daily diet.

Eat regularly a good breakfast, lunch, and dinner.

Drink some milk and eat fruits and vegetables every day.

If hungry between meals eat fruits or raw vegetables.

Eat fruit rather than candy.

Drink plenty of water every day.

Wash his hands before eating.

Sit down while eating.

Take small bites.

Eat slowly and chew food thoroughly.

Refrain from drinking while food is in the mouth.

Refrain from talking while food is in the mouth.

Be calm, cheerful, and polite at the table.

Rest, or play quiet games after meals.

Refrain from exchanging food, or eating food picked from the floor, the ground, or the street.

## Information for the Teacher

The child at this age should realize that his body needs many kinds of food and that he should eat a variety of foods at his three regular meals each day.

Some foods are used for building and repairing the tissues of the body, while others supply heat and energy.

Good eating habits aid the body to use food to best advantage. The child should eat three meals at regular times, sitting properly at the table. He should chew his food thoroughly and eat slowly; take small bites, and drink only when the mouth is empty of food. He should be cheerful and polite.

The lunch hour at school should mean a happy social time, with opportunity for practising good eating habits.

For the growing child fresh fruit and raw vegetables will provide a satisfactory lunch for mid-morning or mid-afternoon; other foods, if eaten between meals,



### What the Child Should Do

Refrain from taking a bite of another's apple or using any food a part of which has been eaten by another.

Wash raw fruits and vegetables before eating them.

### What the Child Should Know

That his body is built up by the food he eats.

That food is fuel for his body.

That his body needs many kinds of food every day.

What constitutes a good breakfast, lunch, and dinner.

Good eating practices.

That he should drink plenty of water every day.

### Information for the Teacher

tend to spoil one's appetite for the regular meals.

Tea and coffee contribute nothing to growth and their use tends to lessen the child's desire for milk.

A good breakfast consists of cereal with milk, bread or toast and butter, milk or cocoa, and raw or cooked fruit. One or two slices of well-cooked bacon or one egg may be added in the winter months.

The school lunch should include soup, cocoa, or vegetables; these may be prepared at home and heated at school or prepared entirely in the school. Bread and butter and a simple dessert of fruit or custard with cookies complete the lunch. When soup or hot vegetables are not provided, sandwiches with suitable filling or a green salad with bread and butter may be substituted.

A good dinner consists of meat or fish, at least one vegetable besides potato, bread and butter, and a simple dessert.

## TEETH

### What the Child Should Do

Eat certain foods every day to help to build strong teeth.

Eat coarse foods every day to exercise his teeth.

Brush his teeth night and morning.

Use and care for his own tooth brush.

Use a tooth brush of proper size and stiffness.

Avoid injury to his teeth by refraining from biting hard things.

Visit the dentist at least three times a year.

### What the Child Should Know

How to build strong teeth.

How to care for his teeth.

That his first teeth of the second set should receive special attention.

### Information for the Teacher

During these years the child's permanent teeth are coming. He continues to lose teeth of the first set and the appearance of new teeth still arouses his interest. This approach should be used by the teacher for presenting what is the most important aspect of health instruction relating to the teeth, viz., the building of strong teeth. To build strong teeth the child should include many kinds of foods in his daily diet, particularly milk, fruits, and vegetables. He needs direct sunshine to help build strong teeth. Sunshine in this Province, however, is lacking in certain growth elements from October to May, and cod liver oil should be taken during the winter months.

Care of the teeth means: cleaning, exercise, dental supervision, and protection from injury. The child should know how to brush the teeth. The upper teeth should be brushed down; the lower teeth should be brushed up; the grinding surfaces of the teeth should be brushed to remove every particle of food; the tongue and the tongue-side of

### Information for the Teacher

the teeth should be brushed. Coarse foods, such as apples, carrots, celery, etc., require chewing, exercise the gums and teeth, and help to keep them healthy. A visit to the dentist at least three times a year is necessary. The child should understand that the dentist is a friend who will help keep his teeth in good condition. Biting hard substances or striking the teeth may result in permanent injury.

The building and preservation of the child's secondary teeth should be the objective of the teacher in dealing with this subject in Grades III and IV. The teacher is referred to the outline for Grades I and II.

## PLAY AND RECREATION

### What the Child Should Do

Sit, stand, and walk with ease and grace.

Play active games out-of-doors every day.

Play harmoniously with children of his own age.

When warm from playing put on coat or sweater to prevent chilling.

### What the Child Should Know

That games are happier when children take turns in being leaders and followers.

How to play games involving simple self-direction and co-operation.

### Information for the Teacher

The play interests of the child reflect changes in his mental development. These do not appear as sudden breaks and there will, therefore, be a natural continuity in the games. The young child is interested in those games in which he as an individual dominates the entire play. Later he becomes interested in games in which other children participate. There are simple rules governing these games and from them the child learns his first lessons in harmonious association with others.

He is now becoming interested in sitting, standing, walking, running, and catching, etc., according to the rules of the game.

In these grades the school work often presents real difficulty to the child and he may become discouraged and so lose interest in the class-room activities. These are the grades where retardation frequently becomes apparent. Through successful participation in play and recreation a child who is becoming discouraged may regain his feeling of adequacy. This will have a carry-over into the class-room activities.

There are certain children who make a success of their class-room work but who are unable to gain similar success in play with children of their own age.



### Information for the Teacher

As one of the most important values of play is its contribution to the emotional and social health of the child, it is imperative that every effort be made to have children establish social contacts with other children of their own age. A child who displays a desire to play with younger children should be tactfully led to play with those of his own age and gain satisfaction through successes in these games. Teachers in these grades are referred to the reference on Play and Recreation in Grades I and II.

The play activities of these grades should be more advanced than those of the preceding grades. At the same time, the teacher should not discourage the child by expecting him to participate in games suitable only for older children. The bases of judging the suitability of a game for these grades are that it interests the child, that it involves participation in simple group organization, and that it provides an opportunity for the child to win some measure of success.

Extensive literature on recreative activities is available in recent books and in current educational magazines. Teachers should make themselves familiar with this literature.

## AIR AND SUNSHINE

### What the Child Should Do

Co-operate in keeping the air in the class-room cool and in motion.

Play out-of-doors in the sunshine every day.

### What the Child Should Know

That sunshine helps him to grow.

That there should be sunshine in the class-room.

That the temperature of the room should be between 68° and 70°F.

How to read the thermometer.

That the air in the class-room should be cool and in motion.

That he should play out-of-doors for a part of every day.

### Information for the Teacher

For the well-being and comfort of both pupils and teacher the air in the class-room should be cool and in motion. Everyone works best, feels best, and accomplishes most, both mentally and physically, in a room with a temperature not exceeding 68°-70°F. Windows should open top and bottom and a slight motion of air is desirable rather than a heavy draught. Children should not sit in draughts. To overcome direct draughts a deflector made of glass or wood is effective.

Valuable activities for the child to carry out in the class-room are reading the thermometer and regulating ventilation by the windows. He will learn that

### Information for the Teacher

open windows provide satisfactory ventilation and that it is better to open several windows, top and bottom, than to open one window full length and cause a heavy draught.

The child should compare his feelings in a well ventilated room with his feeling in a poorly ventilated one.

The child needs sunshine for growth. Throughout the year play activities should be so organized that, except when the weather is inclement, the child should play out-of-doors. Recess periods have been provided under the Regulations to meet this need of the growing child.

Detention at recess and after school hours deprives the child of outdoor air and sunshine and is not in keeping with modern health practice.

In this Province sunshine is lacking in certain growth elements from October to May. These are found in cod liver oil and the child should be encouraged to take it during the winter months.

## SLEEP

### What the Child Should Do

Sleep eleven hours every night.

Retire at a regular time each night.

Make proper preparations for going to bed.

Use low pillows and bed-coverings which are warm and light in weight.

Air bed clothes every morning.

### What the Child Should Know

How to get ready for bed.

How much sleep he needs.

The best conditions for sleeping.

### Information for the Teacher

Sleep is necessary for growth. A child who is securing adequate sleep will be alert and ready for the activities of the day. At this age the child requires eleven hours' sleep. In considering this requirement he will be interested in comparing his feeling of well-being on a morning after eleven hours of sleep with his feelings following a night of insufficient sleep.

The child in this age-group should be held responsible for getting himself ready for bed and for going to bed at the same hour each night. The teacher will find preparation for bed outlined in the Course for Grades I and II. The best conditions for sleeping are: a light evening meal; a happy, quiet period before going to bed; a low pillow; adequate but light covering; a darkened room with the window open.



## REST AND RELAXATION

### What the Child Should Do

Relax during rest periods in school.  
Rest after meals.  
Rest after strenuous games.

### What the Child Should Know

How and when to relax and rest.

### Information for the Teacher

The child requires periods of rest and the class programme should provide for a definite rest period of five minutes' duration each morning and afternoon. A simple method is to allow the children to rest the heads on folded arms on the desk. The playing of soft music will aid in relieving tension.

To afford relief and to prevent fatigue, frequent relaxation periods should be arranged. During these periods the children should be out of their seats. A simple game will relieve the tension of class-room activities. The participation of every child is important, and spontaneity and originality add to the value. Except in inclement weather these periods should be taken out-of-doors, and should not exceed a period of four or five minutes. During the relaxation period the teacher will have an opportunity to teach a simple game which the children will carry on by themselves at recess, at the noon hour, and in their home play.

## SAFETY

### What the Child Should Do

Cross the street carefully.  
Walk carefully on a country road, facing oncoming traffic.  
Avoid playing with fire.  
Play in safe places.  
Avoid playing with sharp articles.  
Swim only in safe places.  
Roller skate in safe places.  
Skate on safe ice.  
Avoid riding on handle-bars of a bicycle.  
Coast on safe hills.  
Avoid catching on to a truck, sleigh, or other moving vehicle.  
Avoid darting out into the street or running from behind parked cars.

### What the Child Should Know

How to cross the street.  
What to do in case of accident.  
What to do in case of fire.

### Information for the Teacher

Provincial statistics indicate a marked increase in accidents to children of ages represented in Grades III and IV. These statistics should impress on the teacher the necessity of giving special attention in these grades to safety as part of health instruction. As has been pointed out in the introduction to the health instruction for these grades, children are now explorative and try to emulate the actions of older companions. They do not realize the limitations due to their age. Sometimes they are regarded as reckless and foolhardy when in reality they stand in need of direction to show them how to act with safety to themselves and to others.

Safety instruction in these grades should be compatible with the child's developing interests and capabilities.

Statistics show that drowning, street and highway accidents are responsible for most of the casualties to boys of this age-group, while accidents in the home

### What the Child Should Know

How to avoid common accidents.  
Where to play safely.  
How to swim.  
That he should not molest strange animals.

### Information for the Teacher

and on the highway account for most of the casualties among the girls.

Local conditions are oftentimes responsible for accidents and should be known by the teacher in order that the instruction may be definitely related to real life situations.

Children at this age are oftentimes careless in regard to fire and should receive special instruction with respect to all fire hazards such as bonfires, fire-crackers, etc. If one's clothing is on fire, one should lie down on the ground and roll to extinguish the flames. If another's clothing should become ignited, he should be wrapped in a blanket, rug, coat, or any similar article and rolled on the ground to put out the fire. The child should also be instructed how to turn in a fire alarm.

The teacher should have the children find out the location of the fire-alarm boxes nearest the school and their homes and instruct them to have an adult put through the alarm when necessary. The best safety measure in case of fire or an accident of any kind is for the child to call an adult or an older child.

Swimming is a healthful recreational activity. Children of this age become interested in the water and will try to swim when they see older children enjoying this sport. The health programme for these grades should, therefore, include the teaching of swimming to all boys and girls before they complete Grade IV. They should learn which are the safe places for swimming in their home community.

### References for the Teacher:

- Bailey and Selover: *Cave, Castle and Cottage*. Follett, 1937. (Moyer, Toronto.)  
Davies, Marjorie: *Con Moto Rhythmic Series*. Book II—Handbook for Juniors. Music in separate volume. University of London Press, London, 1937. (Clarke, Irwin, Toronto.)  
Jean and Hallock: *Spending the Day in China, Japan, and the Philippines*. Harper, 1932. (Clarke, Irwin, Toronto.)  
Polkinghorne, R. H. and M. I. R.: *Toy Making in School and Home*. Harrap, 1937. (Clarke, Irwin, Toronto.)

### References for the Pupils:

- Andress and Bragg: *The Sunshine School*. Ginn, Montreal, 1928.  
Andress, J. Mace: *Wide-Awake School*. Ginn, Montreal, 1931.  
Beauchamp, Fogg, Crampton, and Gray: *Science Stories*. Books II and III. Gage, Toronto.  
Bone and Adshead: *Little Boy and His House*. Winston, Toronto, 1937.



- Bool, Charles J.: *People Far and Near*. Pitman, Toronto, 1936.
- Breeze, Elizabeth G.: *Health by Doing*. Ryerson, Toronto, 1937.
- Brooks and Finch: *Children of Many Lands*. University of London Press, 1934. (Clarke, Irwin, Toronto.)
- Brownell, Ireland and Siegel: *Happy Living*. Rand, 1937. (Gage, Toronto.)
- Burns, A. J.: *Stories of Shepherd Life*. American Book Co., 1934. (Gage, Toronto.)
- Carpenter and Frances: *Our Little Friends of the Netherlands; Norway; Eskimo Land; Arabian Desert*. American Book Co., 1935. (Gage, Toronto.)
- Charters, Smiley and Strang: *Good Habits*. Macmillan, Toronto, 1936.
- Charters, Smiley and Strang: *Living Healthfully*. Macmillan, Toronto, 1936.
- Clyde and Langham: *World of Nature*. Noble and Noble, 1935. (Clarke, Irwin, Toronto.)
- Cons, George: *Village Peoples*. University of London Press, 1937. (Clarke, Irwin, Toronto.)
- Craig and Baldwin: *Out-of-Doors*. Ginn, Montreal, 1933.
- Craig and Burke: *We Look About Us*. Ginn, Montreal, 1933.
- Dandsill, Theresa: *Health and Growing Up*. Sanborn, 1937. (Clarke, Irwin, Toronto.)
- Fellows, Muriel H.: *Land of Little Rain*. Winston, Toronto, 1936.
- Finch, Robert: *Ourselves and Other People*. University of London Press, 1937. (Clarke, Irwin, Toronto.)
- Fowlkes, Jackson and Jackson: *Healthy Bodies*. Winston, Toronto, 1936.
- Fowlkes, Jackson and Jackson: *Healthy Growing*. Winston, Toronto, 1936.
- Hardingham, B. G.: *Over Land and Sea*. Nelson, Toronto, 1937.
- Hardingham, B. G.: *Round the Globe*. Nelson, Toronto, 1935.
- Lee: *Children of Banana Land*. Thomas Y. Crowell Co., 1936. (Clarke, Irwin, Toronto.)
- McGuire: *Glimpses of Long Ago*. Macmillan, Toronto, 1937.
- Nida, W. L. and S. H.: *Trailing Our Animal Friends*. Heath, 1928. (Copp, Clark, Toronto.)
- Patch and Howe: *Outdoor Visits, 1936; Hunting, 1936*. Macmillan, Toronto.
- Persing and Peebles: *Elementary Science by Grades*. Book II. Appleton-Century, 1935. (Ryerson, Toronto.)
- Rice, Wood, Phelan, and Lambkin: *Now We Are Growing*. Nelson, Toronto, 1936.
- Scott: *Dawn Boy of the Pueblos*. Winston, Toronto, 1935.
- Smith, N. B.: *In City and Country; Near and Far; Round About You*. Silver, Burdett & Co., 1935. (Gage, Toronto.)
- Sperry, Armstrong: *One Day with Jambi in Sumatra; One Day with Manu; One Day with Tuku*. Winston, Toronto, 1934.
- Stembridge, J. H.: *Seeing the World*. 1934. *Peoples and Homes of Other Lands*. 1935. Oxford University Press. (Clarke, Irwin, Toronto.)
- Towse, Mathews, and Gray: *Health Stories*. Book II, 1934, Book III, 1935. Gage, Toronto.
- Turner and Pinckney: *In Training for Health*. Heath, 1935. (Copp, Clark, Toronto.)
- Turner and Hallock: *The Voyage of Growing Up*. Heath, 1935. (Copp, Clark, Toronto.)
- Wells, Anne E.: *Health Stories and Practices*. Ryerson, Toronto, 1937.
- West and Leeds: *Boys and Girls Far Away*. Arnold & Son, 1937. (Macmillan, Toronto.)
- West and Leeds: *Geography at the Grocer's*. Arnold & Son, 1937. (Macmillan, Toronto.)
- Williams and Dandsill: *Health and Happiness*. Sanborn, 1930. (Clarke, Irwin, Toronto.)
- World's Children Series, The: *Jean and Franchon, Children of Fair France; Klaas and Janske, Children of the Dikes; Anton and Trini, Children of the Alpland; Beppo and Lucia, Children of Sunny Italy; Erik and Britta, Children of Flowery Sweden; Karl and Gretel, Children of the Fatherland*. Silver Burdett & Co. (Gage, Toronto.)

## CHAPTER XV

### HEALTH INSTRUCTION IN GRADES V AND VI

Before beginning the work of Grades V and VI the teacher should read carefully the outline of Health Instruction for the four junior grades. Health instruction must progress in harmony with the developing life of the child. In the past there has been a failure to recognize the necessity of such progressive presentation. The child who is beginning his fifth year at school is naturally not interested in those things which held his attention in the junior grades. The teacher cannot hope to maintain his interest in health unless there are new approaches. Health education will assume a new emphasis in these grades. The child desires to know why he should carry on certain health practices. Hitherto he has not been especially concerned with reasons but rather has been interested in the techniques of doing. The establishment of health habits continues to be the major objective of health education but, as the child grows older, these habits must be rationalized for him if they are to continue as an influence on his conduct.

This rationalization will be accomplished through activities and simple experiments worth while to the child and leading to scientific and technical knowledge which he can comprehend. In the junior grades the children learn that they should eat a variety of foods; in the intermediate grades they learn why they eat different kinds of foods and what are the specific contributions of these respective foods to health and growth.

The teacher who presents brushing teeth as subject matter for class instruction in Grades V and VI has failed to grasp the principle of progression in health instruction. If this subject is given consideration in these grades it should be a matter of personal conference between the pupil and the teacher. In the intermediate grades the responsibility of the teacher in the establishment of health habits should be limited to the needs of individual children who have not yet established, as habits, those practices conducive to health.

This is the pre-adolescent period and the child, at this age, will resent direction of his conduct by another unless this direction gives him increased control of his own life through information which he understands and which he can apply in situations and experiences which confront and challenge him.

Home co-operation continues to be essential and the teacher should, as a preliminary to all health instruction, have a knowledge of the personal, home, and community background of each child. He should invite the parents to visit the school, when he will explain the objectives and organization of health education which he proposes to carry on during the year. These conferences



are very important since they offer an opportunity for the parents to learn that health education, by developing habits and attitudes, is seeking to bring the practice of living into line with accurate scientific knowledge. Teachers have found that many parents take advantage of these visits to the school to discuss the personal health problems of their children.

Children of this age are influenced by the social standards of the various groups to which they belong. The child's home may exemplify the best types of health practices in keeping with those which the teacher wishes to inculcate but the influence of the home and the school may be discounted because of the child's admiration for and allegiance to standards and practices of a neighbourhood gang or other social group. If the teacher finds that a number of the boys belong to a Boy Scout organization or several girls belong to the Girl Guides the co-operation of these organizations will be as essential as that of the home.

The principles of healthful school living should be used by the teacher to appraise and determine the activities, procedures, and techniques of learning used in the class-rooms. The school is preparing the child for adult life. The preparation during these years should emphasize the procedures of learning rather than the information which may be imparted. The child is living in a changing world where the new discoveries of science are constantly enforcing revision of ideas relative to health. The best contribution which the teacher can make to the child at this time is to direct his thinking so that he will question dogmas and seek to test information scientifically and experimentally. For this reason the teacher should not stress the accumulated information as having primary importance but rather should emphasize that the procedures by which he is gaining knowledge have validity during school life and will continue to be useful to him throughout his adult life. Health education seeks to bring the practice of living in line with changing scientific discoveries. These are progressive and not static and the teacher should at no time leave with the child the thought that knowledge acquired to-day is final.

It is essential that the self-confidence of the child be strengthened. This may be done by giving him increased responsibility for his own actions and encouragement to explore and to experiment. Repression and restriction which limit the child's opportunities for experimentation and discovery of things for himself may give rise to serious problems of discipline. Domination by the teacher is not a solution for these problems. Domination is characterized by inflexibility and lack of understanding. It may secure external submission but it increases the conflict, with resultant emotional disturbances involving resentment, fear, shame, timidity, or other undesirable personality traits. If a sincere effort is made to study and clarify a situation which involves misunderstanding there will inevitably be revealed a purpose common to both teacher and child. This will aid in a mutual understanding of each other's motives, and will, therefore, result in learning experiences through reciprocal

responses. Such learning experiences will contribute to the development of personality. The teacher should give the child the opportunity to work out his own solution. The procedures by which he arrives at this solution become worth-while experiences to him. Even though the child's solution contains an element of error it still remains a learning experience for him since it is through failure as well as through success that the individual discovers truth.

In these grades the limitations of certain children will become apparent and it requires intelligent individual directions by the teacher to lead these children to accept such limitations without self-pity or withdrawal from the normal activities in which they can successfully participate. The teacher should so plan the organization of the class-room that competition, examinations, and homework assignments do not cause anxiety and emotional disturbances.

Children in the intermediate grades are becoming self-conscious of their physical needs. The child will know that he is free to leave the room and go to the toilet when, on his own decision, this is necessary. The attitude of the teacher to these personal matters of health will contribute to a wholesome and healthful atmosphere of the class-room. A discussion of the elimination of body wastes is provided in the outline of health instruction. This should be treated in a scientific and accurate way by the teacher, and it should be linked up with the practices of the children.

The detention of a child as a punishment to complete unfinished assignments or to correct work may cause resentment with resulting serious upsets in his emotional life. Every child should leave school at the end of the day with the feeling that he has accomplished some worth-while success. The memories of these will give him confidence which will enable him to deal with more difficult problems as these arise in and outside of the school.

The intelligent and informed teacher will recognize the important health value of the opening and closing exercises. In the junior grades the participation of the pupils was an important factor. This should continue in the intermediate grades, where broader and more varied activities are possible.

The teacher should make a daily health and cleanliness appraisal of each child. No responsibility for this should be assigned to any child in the class, since this appraisal should provide the teacher with a means of noting the health conditions of each child before the daily work of the class-room is begun.

Relaxation, play, and recreation contribute to health. Each morning and each afternoon there should, therefore, be a period during which the children are allowed to relax completely. These periods need not be extended beyond four or five minutes and they should be additional to the recess periods. At such times the children should be free to move about, secure a drink, or engage in a simple game. The teacher should make sure that all participate in the relaxation.



In the junior grades provision has been made for rest periods. All pupils in the intermediate and senior grades do not require them. There are, however, individual pupils who do need such periods. These should be considered by the teacher in planning healthful school living.

In order that the teacher may determine the special health problems to be emphasized during the year, both in the health practices and in the instruction, a survey of the health practices and status of each child should be made as soon as possible after the opening of school. In the junior grades the teacher has assumed full responsibility for this survey. In Grades V and VI the child should co-operate with the teacher. This self-criticism will be a means of helping him to discover his personal health needs. With the teacher's guidance he will be able to plan and work out those measures which will meet his needs and increase his capacity for participating in activities suitable for boys and girls of his own age.

### UNITS, ENTERPRISES, AND OTHER ACTIVITIES

Health instruction should be carried on through simple experiments, units, enterprises, and other activities. Emphasis should be placed upon pupil activity involving planning, observing, and constructing. It is important that the instruction should be on the grade level of the child and that the activities undertaken by the children should be worth while to them. Formal teaching should be used only where the instruction cannot be presented through experiments and activity procedures.

At this age the child is becoming increasingly conscious of the fact that his life is bound up with that of others and that he should be led to acquire his health knowledge through a study of industries, workers, and products which contribute to his health and well-being.

Teachers have reported many valuable correlations of health instruction with lessons in social studies and natural science. The following units and enterprises have been worked out in certain schools in the Province.

**Lumbering.** When they were beginning work in manual training the children became interested in woods of various kinds. This interest was encouraged and a survey was made of the class-room to note the various articles made of wood. It was found that floors were made of maple, the wood-work of oak, the desks of birch. A general discussion of various woods followed. Samples of different woods were brought to the school. One child was able to secure some pieces of Douglas Fir from British Columbia; another child brought a piece of mahogany; and a third, a piece of walnut. The various woods were mounted and named. From this study of woods the children began to inquire about the trees, and this led to a study of lumbering. On a map of Canada the children marked the location of forests. The teacher

suggested that the children find out the various processes by which a growing tree was transformed into lumber. The children were able to secure materials and interesting information regarding this industry. A lumber camp was built on the sand-table. The sleeping quarters were first erected, bunks were built in and bedding was made for these. The children found that these sleeping shanties should have windows to give light and that these could be opened to give ventilation. The need for washing and toilet facilities was then discussed and provision was made for them. The water supply was next considered and the children studied means of keeping this supply free from contamination. The lumberman's need for food was next considered. A cook-house was built. The children learned that the food supply of a lumber camp was in charge of a cook who was familiar with the preparation of well-balanced meals for outdoor workers. Several projects on planning meals for lumbermen were worked out. These meals were then compared with the meals of the children. The various buildings in the camp had to be heated; stoves were used, but in order that the heat from the stoves might be distributed throughout the rooms, jackets were placed around the stoves. The lighting of the camp became another interesting project. The care, the food, and the stabling of horses and other animals in the camp were studied. The clothing of the lumberjacks lent itself to a study of materials and their use in various seasons. Measures for prevention of accidents and for protection against fire were also studied. The children learned that in present-day lumber camps there are facilities for reading, study, recreation, and religious life. Since lumbermen live a long distance from settlements, special care had to be taken for the protection of their health. The men were immunized against small-pox and typhoid fever. A doctor visited the camp every two weeks.

Similar units and enterprises have been carried out on mining, fishing, grain-growing, ranching, dairy-farming, market-gardening, fruit growing, and manufacturing. These units presented excellent opportunities for introducing the study of sanitary environment, food, clothing, recreation, and prevention of disease, and were adapted to the age level of the children.

**Transportation.** An aeroplane flying over the school gave rise to a discussion of various ways in which people travel from place to place. From this the pupils talked about carrying mails from place to place and from one country to another. Then some one suggested that foods, clothing, and other materials were carried from place to place and from one country to another. The class decided they would like to work on a unit related to transportation. They first considered the transportation of food. One group selected for study the food used at breakfast; another the food used at dinner; and a third the food used at supper. Still another group took as their subject the foods in a Christmas dinner.



The group working on the breakfast foods divided themselves into smaller groups, one of which worked on fruits. They studied the growing, picking, and packing of fruit in their community. From this they followed to citrus fruits, dried fruits, and other fruits, such as pineapples, bananas, dates, and figs. They learned different ways of treating fruits so that they could be shipped from one place to another. They learned about drying fruits such as prunes, raisins, and apricots; about canning fruits, making fruits into preserves and jams, and extracting the juices from fruits. These studies presented many opportunities for activities in the class-room with actual fruits. The food values of specific fruits were studied. Another group worked on cereals. They studied the growing, harvesting, threshing, and marketing of grains; the milling of cereals into flour and the making of other cereal food products. This gave an opportunity for studying the necessity for cleanliness in the handling of foods. The relation of water, sunshine, and food to growth was stressed. Other groups studied milk, eggs, and bacon.

Transportation was related to clothing, various groups studying clothing suitable for travelling at different seasons and in different countries. A consideration of the material used in making such clothing became an interesting phase of this unit.

One group of children studied how people travel. They visited a transcontinental train and saw the arrangements for sleeping and eating, and the washing and toilet facilities. The air conditioning of the coaches to provide clean, cool, moving air was of special interest. For those children who could not visit the train the teacher secured pictures and full information from the railway so that the study became very real.

Similar units were worked out on steamship transportation and during the past year a study of transcontinental travel by aeroplane was made in a number of class-rooms.

Recreation and safety as related to travel were some of the topics studied under these units. Children found that transportation made it possible for them to secure products essential to their welfare from all parts of the world. Without transportation they would be dependent upon the products and facilities of their own neighbourhood.

After the children had studied moulds and bacteria in Grade VI they became interested in the various methods of protecting food while it was being shipped from one country to another. A study of cold-storage warehouses and refrigeration on trains and steamships was developed from the work on bacteria and foods.

Interesting activities grow out of the class-room museum. Children should be encouraged to bring household articles used in pioneer days; articles made and used in other countries; photographs, pictures, and printed materials which interpret the personal and social life of other peoples. These collections

will be an aid in leading the child to a knowledge of living conditions outside his immediate community. The class-room museum may also attract the interest of the parents. It is valuable too as an aid in the development of hobbies.

### HEALTH PRACTICES

In these grades the child assumes increased responsibility for his health practices. His first responsibility should be the making of a personal survey under the teacher's direction as soon as possible after the opening of school. His health practices should now begin to show the result of the constant emphasis placed upon them throughout the lower grades. The teacher should study carefully the personal survey of each child. This study will determine the basis for the sequence of the work and relative emphasis to be placed on the different health practices. Throughout Grades V and VI no new practices are introduced, but a definite effort should be made to have each child realize that before he leaves Grade VI his health practices should have developed into well-established habits.

Health practices in the child's daily life are summarized below. As these have received explicit direction in the junior grades there should be no necessity for making them a subject of class instruction in Grades V and VI. To do so would be justified only where the personal surveys of the pupils revealed the need of such instruction.

**Health Practices Relating to Food.** The child should have a varied daily diet, which should include milk, fruits, and vegetables. He should have a good breakfast, lunch, and dinner and these should be eaten at regular hours. It is important that a sufficient quantity of water be drunk each day. Fried foods should be avoided. Candy and sweets should be eaten at meal time only, and then only at the end of the meal. Meal time should be characterized by cheerfulness, calmness, and politeness. The hands should be washed before eating and before any food is handled. Children should not exchange food with one another. Food picked up from the ground, the floor, or the street should not be eaten unless it has been thoroughly washed. After eating it is desirable that the child should rest and not indulge in strenuous activities of any kind. Eating between meals should be restricted to fruit or raw vegetables.

**Health Practices Relating to Teeth.** The daily diet should include those foods which help to build strong teeth and surrounding tissues. Coarse foods should be eaten, since these exercise the teeth and the gums. Cleansing of the teeth is essential, and can best be accomplished by adequate brushing of the teeth and gums at night and after eating. Each child should use and care for his own brush. The teeth should be protected from injury. Certain irregularities of the teeth may be prevented by avoiding faulty position during sleep. Regular and adequate supervision by the dentist is essential.



**Health Practices Relating to Sleep, Rest, and Recreation.** The child should have an adequate amount of restful sleep each night. This amount will vary from ten to eleven hours.

Relaxation is necessary to prevent fatigue and to relieve strain of the eyes and of the various muscles of the body. Some children in certain circumstances require short periods of absolute rest.

Daily play should include active participation and happy co-operation with others in group games played out-of-doors, and in the sunshine when possible. To prevent chilling, the child should put on extra wraps after strenuous play.

**Health Practices Relating to the Eyes.** The child should care for and protect his eyes and read only in a good light, holding the reading material about fourteen inches from the eyes. In doing class work he should have the light come over the left shoulder. He should not read while lying down or in a moving car. He should rest the eyes occasionally by closing them or by looking at distant objects; avoid glare and looking directly at the sun or other bright objects; refrain from rubbing his eyes; and keep the hair trimmed or arranged so that it does not hang over the eyes. If glasses are prescribed by a physician, the child should wear them and keep them properly adjusted.

**Health Practices Relating to the Ears and Nose.** The child should care for and protect his ears. He should avoid hitting or pulling or shouting into the ear of another. He should put nothing in his ears; exercise care in cleaning them; and remove all water from the ear after bathing or swimming. He should also care for and protect his nose.

**Health Practices Relating to the Feet.** The child should give the feet special care. He should wash them every night; keep the toe-nails short and clean; change the stockings at least twice a week; and wear stockings and shoes of the right kind and size.

**Health Practices Relating to Cleanliness.** The child should come to school clean and neat; keep the finger nails short and clean; and should refrain from biting them. He should wash the hands after going to the toilet and before eating; take a full bath more than once a week, using his own toilet articles; and wash the hair at least once in two weeks. He should have a bowel movement at least once a day, and go to the toilet whenever necessary.

He should help to keep the school grounds, class-room, corridors, cloak-rooms and basement clean; and help to keep the toilet and hand-washing facilities clean. He should keep his own desk and the floor immediately about him clean, and keep his own books clean.

**Health Practices Relating to Clothing.** The child should wear clothing suitable for comfort, for weather, and for recreational activities, and should care for his own clothing by removing extra wraps and sweaters when indoors,

and by hanging them up. He should remove any damp clothing as soon as possible after he arrives at school or home and remove his rubbers and goloshes when indoors.

**Health Practices Relating to Safety.** The child should obey traffic signals and cross the street carefully and at intersections only; walk carefully on a country road, facing oncoming traffic; refrain from asking or accepting rides from strangers; refrain from catching on to a truck, sleigh, or other moving vehicle; refrain from darting out into the street or running from behind parked cars; ride a bicycle carefully; refrain from catching on to any moving vehicle; play in safe places; swim in safe places; skate in safe places; roller-skate in safe places; coast on safe hills; refrain from playing with fire.

**Health Practices Relating to Communicable Diseases.** The child should sit alone in his own seat; avoid contact with people at home and at school who have a cold or are sick; remain at home if he has a cold or feels sick; use an individual drinking cup; use a drinking fountain without touching the bubbler with the lips; keep the hands, pencils, books or other materials away from the face and out of the mouth; use only his own handkerchief; cover his nose and mouth with a clean handkerchief when coughing or sneezing; keep himself supplied with a clean handkerchief and use it when necessary.

## HEALTH INSTRUCTION IN GRADE V

In Grade V health instruction will centre around the reasons for the various health practices and techniques. Nutrition, including food, sunshine, rest and sleep, play and recreation, will be the basis of all instruction throughout the year. In addition to this, there will be a consideration of those health practices which the personal surveys of the pupils have shown to be necessary for class instruction. Gain in weight and in height is an indication of growth, and the children will continue to take an interest in periodic weighing and measuring. They will now be able to assume some responsibility in weighing and measuring and in recording their height and weight on individual charts. The teacher should encourage the pupils to participate in these activities. The use of individual height and weight graphs should be introduced. The child is now regarding his health conduct and his health status as personal. For this reason, the use of class-room charts which reveal personal practices, weights, and heights should be discontinued. The teacher should realize, however, that weighing and measuring continue to be a valuable motivation in health instruction.

There should be at least two twenty-minute periods of direct health instruction each week in this grade. This is in addition to the time devoted to experiments, enterprises, play, and recreational activities. The programme presents



many and varied opportunities for correlating health with social studies, natural science, manual arts, household science, English, and music.

Problems which now arise in the child's mind are listed below. Health and growth depend upon many factors. It is important, therefore, that in helping the child to solve his problems the teacher should understand and should follow the scientific laws of health and growth. The order in which the problems are considered and the relative emphasis which they should receive will depend on the needs and interests of the individual child and of the class as a whole. The reasons for health practices will grow out of wide areas of life situations, experiences, and activities.

## FOOD

### Problems for the Child.

- Oct. 7- { Why should I eat many kinds of food?  
Which foods help me to grow?  
Oct. 9. { Which foods help me to keep warm?  
Which foods help me to work, to play, and to move about?  
Why does my body need iron and calcium?  
Which foods contain iron and calcium?  
Which foods contain vitamins?  
Why does my body need water each day?  
Why should I drink milk?  
Why should I not drink tea and coffee?  
How is the food I eat changed so that it may be used by my body?  
What are the food materials my body needs each day?  
Why should I have good table manners?  
Why should I be cheerful at my meals?  
Why should I rest after eating?

**Information and Suggested Activities.** The child in normal health increases in height and in weight from day to day. Growth during childhood is rapid. This rapid growth and the tremendous amount of activity in which the child indulges make great demands upon the body. These demands can be met only if nutrition is adequate. Nutrition includes food, sunshine, rest and sleep, play and recreation.

The food requirements are many and varied. Because the body is growing it must have materials to help it grow and to build bones, teeth, muscles, blood and nerves, and other tissues. Because the body moves, it must have materials to supply energy.

No one food contains all the materials which the body needs. A variety of foods must therefore be included in the daily diet.

Materials for growth and repair are called proteins and are found chiefly in meat, milk, cheese, eggs, fish, beans and other vegetables.

Some materials are needed to supply heat and energy. These are carbohydrates and fats. The chief sources of carbohydrates are sugar, honey, cereals, bread, rice, potatoes, some vegetables and fruits. The best sources of fat are butter, milk, fish, eggs, cheese, and certain vegetables.

Mineral salts are important for various purposes. Two of these salts are calcium and iron. Calcium is needed to help build strong teeth and bones, and is found chiefly in milk, cheese, cauliflower, oranges, spinach, carrots, peas, and beans. Iron is needed for the blood and is found chiefly in prunes, raisins, dates, beef, beef-liver, lamb, veal, and eggs.

Vitamins give protection to the body and are needed for growth and health. The best sources are milk, fruit, and vegetables. Sunshine and cod liver oil also provide an important vitamin.

Water and other liquids are necessary to aid in elimination of body wastes.

Before food is used by the body it must be changed. This change is called digestion. The food is first broken up by chewing, is sent through the gullet into the stomach, and then passed to the small intestine. The digestive juices aid in changing solid food to liquid. They also are responsible for certain chemical changes which make absorption by the body possible. Through the walls of the small intestine the changed food materials needed by the body are absorbed and carried to all parts by the blood-stream. The bowel or large intestine receives the solid waste material that the body cannot use. Since this is waste it should not be retained but should be eliminated from the body every day. The necessity of a daily bowel movement is thus apparent.

Real foods rather than pictures or descriptions of foods, should be used by the teacher for teaching purposes. The home gardens, orchards, farms, school gardens, markets, and stores are sources of materials for such studies. After the child has handled and studied real foods, models of foods may be made.

An enterprise based on the foods grown and processed in the home community may be undertaken. The children may plan a day's meals using only foods grown in the community. The foods may then be classified according to what they do for the body.

Another enterprise is to study all the foods used by a family in the home. The children will trace the country of origin, conditions of growth and processing, and means of transportation by which the food is brought to the community. Correlation with social studies will stress such topics as sunshine, rainfall, character of soil, and methods in agriculture.

Menus for balanced meals for a family may be planned by the class, using seasonal foods. Finding the cost of such meals may furnish a problem in arithmetic.

A class picnic, sleighing party, or hike with bonfire supper may also be planned. The menu will be worked out on a basis of materials needed by the body, taking into consideration the other meals of the day. Determining the



quantity and cost for the group and for the individual will furnish further material for practical problems.

A study of milk and milk-producing animals in different countries of the world has been found interesting and valuable. The making of such milk products as butter, cottage cheese, ice-cream, junket, custard, and cream soup is possible in the class-room and adds interest to class-room activities.

## SLEEP

### Problems for the Child.

Why do I need sleep?

How should I prepare for bed?

What are the best conditions for sleeping?

How much sleep do I require?

**Information and Suggested Activities.** During sleep the body lies quietly with the muscles relaxed; the heart beats less rapidly; and the breathing is less frequent. Sleep aids growth. Sleep gives rest to the brain and to the nerves.

Boys and girls of this age require between ten and eleven hours' sleep each night. Preparation for bed: remove all day clothing and hang it up to air; put on clean night-clothes; cleanse the teeth and mouth; wash thoroughly; open the window. In addition, the following conditions are conducive to good sleep: a light evening meal; a happy quiet time before going to bed; a low pillow and adequate but light covering; sleeping in a darkened room with the window open.

The child may keep charts showing his retiring and awakening hours, the number of hours of sleep, and his feelings following a night of adequate sleep as compared with those following a night of inadequate sleep. The interest of the child in a record of this type cannot be sustained for more than two weeks at a time. The co-operation of parents continues to be essential.

## SUNLIGHT

### Problem for the Child.

Why do I need sunlight?

**Information and Suggested Activities.** The direct rays of the sun on the skin help the body form its own Vitamin D, which is needed for both health and growth. The healthful way to take sun in the summer is through gradual exposure. Sunburn is to be avoided as too hot sun, with too long exposure, may result in sunstroke or sun poisoning. Sunburn differs from a burn of any other type only in degree; pain, discomfort, and possible infection through the blistered portions are just as likely to occur.

In this latitude, from October to May the sunlight does not contain the health-giving rays which enable the body to form its own Vitamin D. During this period cod liver oil should be taken to supply the necessary vitamin.

A study of the effect of sunlight may be made by observing its action on growing bulbs, grains, and other plants in the class-room itself.

## AIR

### Problems for the Child.

Why is  $68^{\circ}$  to  $70^{\circ}$  F. the best temperature?

Why should the air in a room be cool and in motion?

Why should part of every day be spent out-of-doors?

**Information and Suggested Activities.** Everyone works best, feels best, and accomplishes most, both mentally and physically, in a room with a temperature not exceeding  $68^{\circ}$  to  $70^{\circ}$  F. For comfort and well-being the air in the room should be cool and in slight motion. The child may compare his feelings in a well ventilated room with his feelings in a poorly ventilated one. He should note that he is more comfortable on a hot day when there is a slight breeze than on a hot day when there is no breeze.

In a study of the thermometer the child should become familiar with the graduated markings. By simple experiment he can discover that the coloured liquid rises when heat is brought near and that the liquid drops if the thermometer is immersed in cold water or placed outside in cold weather. By comparing the temperature on given days and by observing whether or not there is a breeze, the child may be led to appreciate the fact that air movement contributes to his feeling of comfort.

The child should learn to read and make graphs of the temperature of the class-room and of the outdoors. A thermometer fastened to the frame outside, which may be read without opening the window, will furnish an additional interest in reading and recording temperature.

By making a survey of the class-room to ascertain whether the windows will open top and bottom the child will appreciate the provision for the movement of the air. Attention should be directed to the purpose of ventilator boards. When related to lighting this study will show that glass deflectors do not shut off light. In manual training the children may make the ventilating deflectors for the class-room.

The following simple enterprise has been used to show the circulation of air in a room. A large carton or box represents a room. The front of the box is covered with cellophane. Two holes are cut in each of the ends to represent the tops and the bottoms of two opposite windows. A cork or a piece of cellophane is used to cover the holes. Incense or an incense taper may be used to produce smoke. The circulation of the air through the room may be followed by tracing the course of the smoke when one or more of the holes is



opened. It will be noted that the best circulation of air takes place when the lower hole on one end and the upper hole on the other end are open. The air currents in the class-room itself should be similarly studied.

## REST AND RELAXATION

### Problems for the Child.

Why do I need rest during the day?

How should I rest during the day?

Why do I need relaxation during the day?

**Information and Suggested Activities.** Relaxation will relieve tension and will enable the child to continue the activities of the school with fresh interest and with renewed feelings of comfort.

A good supply of blood must be available in the stomach to aid digestion. Exercise takes extra blood to the muscles and away from the stomach. The child should rest after eating and after strenuous games.

## PERSONAL CLEANLINESS

### Problems for the Child.

Why should I keep my skin clean?

Why should I come to school clean and neat?

How should I care for my hair?

How does my body rid itself of waste material?

Why should I go to the toilet each day?

What should I do to prevent constipation?

**Information and Suggested Activities.** The body rids itself of waste material in four ways—through the lungs, the kidneys, the bowel, and the skin. The lungs are two in number; they are in the upper part of the body. The child can perceive the action of breathing since the chest moves when the lungs inhale and exhale.

By breathing on a mirror or any other shiny surface, the child can see the evidence of the fact that air is exhaled. To exhale, the lungs must have received air. A pair of toy balloons will give the child a chance to demonstrate for himself the mechanics of breathing. When we inhale, the air is taken into the lungs and given to the blood. When we exhale, the air carries off waste material from the blood.

There are two kidneys, located near the waist line at the back of the body. They help the body get rid of waste material. Because this is waste material it should not be retained in the body. One should go to the toilet whenever necessary.

From the bowel or large intestine the body rids itself of all solid waste material. This is called a bowel movement. Since this is also waste it should not be retained but passed from the body every day.

Constipation is the prolonged retention of waste material in the large intestine. It has harmful effects and every effort should be made to prevent its occurrence. A daily bowel movement is the most important health practice both in childhood and in adult life. It is dependent upon the quality of the food eaten, the amount of water taken, and the practice of going promptly to the toilet when necessary. Unless ordered by the doctor, it should not be necessary to take medicine to produce a bowel movement.

The child of this age may be sensitive about leaving the room. The teacher should, by stressing the scientific basis, develop an understanding of the relationship between internal cleanliness and health, so that every child will regard leaving the room and going to the toilet as something which vitally affects his personal health.

The skin covers the body like a very tight suit of clothes. It has innumerable small openings called pores, which may be seen through a magnifying glass. Through these pores the body rids itself of certain waste material called sweat. Frequent bathing is necessary to remove the sweat and keep the pores open.

The scalp, as well as the skin, has pores through which the body rids itself of waste material. These pores should be kept open by washing the scalp every two weeks. The child should use his own comb and brush.

Any child or adult may become infected with pediculosis. However, the condition will clear very quickly if given prompt and proper treatment. Tactful handling by the teacher will prevent the embarrassment of the child and his ostracism by other pupils.

The child in this grade should be held responsible for his personal cleanliness and appearance and the care of his own clothing.

Some activities which will enable the child to assume responsibility for his own cleanliness may be associated with his provision of an individual toilet box. If the cloak-rooms are not supplied with mirrors the children should become interested in securing one of these for each cloak-room. It should be hung so that the children may check their personal appearance before entering the class-room.

## CLEANLINESS OF SURROUNDINGS

### Problems for the Child.

How can I help keep the school clean?

How can I help keep my class-room clean and attractive?

**Information and Suggested Activities.** Every child must share in helping to keep the surroundings clean. The child should realize that his



surroundings include not only his own desk and the floor immediately about it, but all parts of the school building and grounds. There should be a transfer of interest so that the child will relate the care and cleanliness of the school to corresponding aspects of his home and community.

The child should learn respect for public property since it contributes to his welfare as a member of the community.

On the playground and in the basement the children should plan for and secure covered receptacles. They can learn to dispose of paper, scraps, apple cores, and other waste materials only if proper receptacles are provided. The securing and making of these receptacles by the children will involve valuable learning experiences in health. The use of such receptacles helps also to prevent the breeding of flies.

Cupboards for the individual drinking cups have been made by the children from orange crates. Provision has also been made for the care of school lunches by making shelves or cupboards.

## CLOTHING

### Problems for the Child.

Why should I dress according to the weather?

Why should I dress for comfort?

Why should I remove my sweater, wraps, and rubbers when indoors?

Why should I remove damp and wet clothing?

Why should I wear clean underwear?

**Information and Suggested Activities.** The chief purpose of clothing is to help keep the body at a temperature conducive to health. Unless the clothing is appropriate the body will lose its heat too rapidly or too slowly. In cold weather enough clothing should be worn to keep the body warm. The materials used in clothing are factors in helping the body to regulate its loss of heat. In winter, wool is used; in summer, cotton. After exercise the body is warm and an extra wrap should be put on to prevent the body from losing its heat too rapidly. Too much clothing makes it difficult for the body to get rid of its heat and adjust itself to changing temperatures. For this reason all heavy clothing should be removed when indoors; the extra protection is required when one goes outdoors in cold weather. Wet clothing should be removed as soon as possible since chilling disturbs the normal circulation of the blood and tends to make it easier for one to take cold.

Clothing should be fitted so that one is free to move easily and work and play in comfort. Clothing which is too tight for comfort may restrict free circulation of the blood, as is the case with tight garters, belts, hats, collars, stockings, shoes, and jackets.

Underclothing is cheaper than outer clothing and is worn to protect the latter from body perspiration; it is easily washed; and it can be easily changed

to meet changes of temperature. Underclothing absorbs the waste materials thrown off by the body and soon takes on an unpleasant odour. For this reason it should be changed at least twice a week, or oftener if it is soiled. All clothing should be kept clean and aired frequently.

Activities which may be used in this connection are numerous and varied. The class may dress a pair of dolls, a boy and a girl, planning the wardrobes to meet the school clothing needs of the child in the class for a particular season, or for several seasons. An interesting variation is to build the wardrobe around a special occasion or a trip to be taken during the Christmas, summer, or Easter holidays.

A group activity may be developed by the use of trunks made of cardboard and other materials. The class decides what clothing is needed for a rainy day, a cold day, or a hot day. Following a discussion and choice by members of each group, the various articles are made. They are then assembled and the appropriateness and cost discussed before the different pieces of luggage are packed and labelled.

The clothing used by a fisherman in the northern latitudes compared with that worn by a worker on a citrus fruit plantation in the tropics is but one of a series of vivid contrasts in a study of clothing as related to occupation and climate.

Another activity is an historical study of the costumes worn at various periods in the life of the home community. This will show the types of clothing by the age, sex, and occupation of the wearer; it will provide a parade of style changes for various sports, games, and seasonal wear.

In this grade sewing is included as a part of the household science training. Health principles should be considered in the making of clothing. Simple lessons in laundering given in this grade should be related to cleanliness of stockings, underclothing, handkerchiefs, and other articles.

## FEET

### Problems for the Child.

How should I care for my feet?

Why do my feet require special care?

**Information and Suggested Activities.** The body rests upon the feet just as a building rests upon its foundation. If the foundation is weakened, damage to any part of the structure may result. In the same way, if the feet are defective, one is likely to feel the effects in other parts of the body.

Success in many games, sports, and occupations depends, to a great extent, upon the condition of the feet.

The feet should be washed every night. The nails should be kept clean and trimmed. Since the feet perspire freely and shoes do not allow the ready evaporation of this moisture, stockings should be changed at least twice a week.



Shoes should be comfortable, should have low heels, broad toes, and straight inside lines. Tight shoes prevent the development of the muscles of the feet. The sole of the shoe should be slightly larger than the sole of the foot. An exhibit of shoes with labels showing the good or bad points of the shoes may be assembled.

As part of the class-room museum, collections of shoes may be made, including those used in former days, those used in other countries, and those used in different occupations. The children may also make models of footwear in which they are interested.

## EYES

### Problems for the Child.

Why should my eyes receive special care?

How should I care for my eyes?

**Information and Suggested Activities.** Sight is a priceless possession. Because the eyes are extremely delicate they should be treated with the greatest care and consideration.

The light for close work should come over the left shoulder to avoid shadows on the work. Whether daylight or artificial light is used the amount must be adequate. Books, sewing, or other material should be held fourteen inches from the eyes. The eyes should also be rested frequently by looking at distant objects or by closing them from time to time. Reading in street cars or in other moving vehicles should be avoided as this causes the eyes to change focus continually and strains the tiny muscles. Reading while lying down makes the eyes work in an unnatural position and causes strain. Because the eyes are so delicate the slightest rubbing may injure them. The eyes must be protected from contact with dirty fingers and soiled handkerchiefs or towels as these may cause infection. The hair should be so trimmed or arranged that it does not hang over the eyes. During illness the eyes require special consideration.

An interesting project based on a study of the history of domestic lighting in their own community may be developed by the class. This may later be transferred as a permanent collection to the class museum.

One item in the care of the eyes which may be correlated with manual training is the making of simple reading lamps and shades for use at home and on the class-room reading tables.

Pupils may keep a record of the conditions of natural lighting over a certain period of time, for example, noting the hours of sunshine in the school day during a week in the months of January, November, April, and June. A parallel record may be kept to show the hours during which artificial lighting was used. If a light-meter is available the pupils will be interested in testing the degree of illumination on their individual desks.

Glare should be avoided. The pupils should be given the responsibility for moving their own desks or of changing their seats when necessary to protect their eyes. If glare can be eliminated only by pulling the shades, consideration must be given to the light needs of the pupils farthest from the windows.

### EARS AND NOSE

#### Problems for the Child.

How should I care for my ears?  
Why should I care for my ears?  
How should I care for my nose?  
Why should I care for my nose?

**Information and Suggested Activities.** Good hearing is a most valuable possession and should be protected with the greatest of care.

The ears should be washed carefully with warm water at least once a day. In cleaning the ear nothing smaller than the tip of the little finger should be used. The accumulation of wax or a foreign object in the ear may affect the hearing. On the first evidence of ear-ache or of difficulty in hearing the doctor should be consulted.

Hardness of hearing is usually caused by infection of the middle ear. This infection frequently follows colds, measles, scarlet fever, and diphtheria. A short tube connects the ear with the throat. Through this tube it is fairly easy for material from the nose or throat to reach the ear. For this reason alone, great care should be taken of all nose and throat infections. One should always blow the nose gently so that any infection present will not be forced through the tube into the ear. Hearing may also be damaged by shouting into the ear; by a blow or knock on the ear; or by water forced into the ear when diving or swimming.

Nature has provided the nose with special equipment to prepare the air for the lungs. The nose is lined with a mucous membrane and tiny hairs. The mucous membrane warms and moistens the air. The tiny hairs aid in removing dust and other impurities. Blowing it gently and using only a clean handkerchief are two essentials in the proper care of the nose. It should be remembered also that most bacteria enter the body through the nose and throat.

### SAFETY

#### Problems for the Child.

What do the traffic signals mean to me?  
Why should I cross the street only at intersections?  
Why should I learn to swim?  
What can I do to prevent accidents at school?



What should I do if my clothes take fire?

What should I do if the clothes of another take fire?

Where is the nearest fire-alarm box, and how can I turn in an alarm in case of fire?

How should I leave a bus or car?

Where can I play with safety?

**Information and Suggested Activities.** Accident prevention at school depends on watchfulness and co-operation on the part of every child. Loose boards, rusty nails, broken glass, pieces of tin, or any objects likely to cause accidents, should be noticed by the pupils and reported. Many accidents at school could be avoided if all children would exercise care and would refrain from bullying, roughness, and reckless play. The child of this age should be made conscious of his responsibility for careful handling and replacing of sharp-edged tools, toys, furniture, and similar objects.

Traffic signals are not an interference with the rights of people walking on streets or highways but are a means of protecting drivers and pedestrians alike. Traffic regulations are made to ensure the safe use of the highway to everyone.

In getting off a bus or car the child should alight on the side removed from traffic; take notice of on-coming traffic; face in the same direction as the vehicle; and hold to the conveyance with the left hand.

If one's clothing catches fire one should lie down and roll on the ground to extinguish the flames. Running causes a draught and fans the flames. If another's clothing becomes ignited, he should be wrapped in a blanket, rug, coat, or any heavy material at hand and rolled on the floor until the fire is extinguished.

Through the co-operation of the local fire department, children should be taught the correct method of turning in an alarm.

Each child may make a map of the route which he follows in coming to school, showing all the streets or roads he crosses and each danger spot he passes. Maps of other possible routes may also be made. These may then be compared from the standpoint of safety.

On the sand-table the class may build a model of the community, showing location and equipment of safe places to play.

A play based on the importance of doing the right thing quickly in an emergency may be written and dramatized by the class.

A life situation arising from an accident may furnish valuable experience through discussions and other activities dealing with its causes, possible means by which it could have been prevented, and the measures that should be taken to prevent an occurrence of a similar nature.

## TEETH

**Problems for the Child.**

What do my teeth do for me?

Why should I take special care of my secondary teeth?

How can I build strong teeth?

Why should I go to the dentist?

**Information and Suggested Activities.** One needs teeth to bite, to chew food, and to speak distinctly. Teeth are an important feature of the face and may add to or detract from one's appearance.

At this age, the child is faced among other things with responsibility in the care of his secondary teeth. These should be kept in perfect condition, since, if they are lost, other teeth will not grow in their places.

Care of the teeth includes cleaning the teeth and gums, particularly after meals and at night; exercising the gums and teeth by chewing coarse foods, such as fruit, raw vegetables, and bread crusts; eating those foods which help to build strong teeth and surrounding structures; supervision by a dentist as often as required—at least three times a year.

Care should be taken to prevent the child from sleeping in a position where pressure is exerted on the jaw through cupping the cheek by the hand or arms. This pressure on the jaws of a young child, night after night, may cause irregularities of the teeth.

To build strong teeth calcium is needed. The chief sources of calcium are milk, fresh fruits, and vegetables. Calcium cannot be used by the body except through the aid of Vitamin D. This vitamin is present in certain foods, chiefly milk, fresh fruits, and vegetables; in some of the direct rays of the sun which enable the body to make its own Vitamin D; and in cod liver oil. In Ontario, during the winter months, the sunlight does not give off the particular rays which help the body to make its own Vitamin D; therefore, from October to May, the child should use cod liver oil as a source of this vitamin.

In his health book the child may keep a chart to record whether he cleansed his gums and teeth and to note how his teeth looked and how his mouth felt each day for one week. The child should examine his mouth by means of a pocket mirror. He should then draw a diagram showing his lower and upper teeth. Colour may be used to differentiate the first from the secondary teeth. This chart may be taken home to be checked by the parent. The child should keep a record over a period of a week which may be in the form of a chart, showing the sources from which he obtained calcium. A similar record should be made showing his sources of Vitamin D.

A project of interest is a four-section exhibit. The first section could show calcium as found in nature—lime, marble, coral, and shells. The second section is used to show how nature supplies calcium in various foods. The



third section is devoted to Vitamin D. The fourth section shows a human tooth. This project may be enlarged to include bones as well as teeth.

One of the most interesting learning experiences connected with this topic is the examination by the dentist. This examination may be in a private office or in the school clinic. The child should be prepared for the visit by the teacher and the parent. The dentist should instruct the child in the care of his teeth and should answer the child's questions in terms which he can understand. Such a visit will re-enforce the efforts of the parents, the teacher, and the nurse.

## THE COMMON COLD AND OTHER INFECTIONS

### Problems for the Child.

Why should I remain away from school when I have a cold?

How can I help to protect myself from taking cold?

**Information and Suggested Activities.** Certain infections which result in illness are spray-borne, that is, they are transferred from person to person in the spray from a cough or a sneeze. When taken into the body through the nose or mouth, bacteria often cause illness. Sometimes they enter the body with the air breathed in through the nose; and sometimes they enter through the mouth when food or articles on which they have been deposited are put into or to the mouth. Some of the commoner diseases caused in this way are colds, whooping-cough, and measles.

To help protect himself from infection the child should avoid using articles handled by others. This means that he should use his own toilet articles, have his own drinking-cup, and refrain from borrowing or lending pencils, books, and other school supplies. A child should keep his fingers and other objects away from his nose and mouth. He should have a clean handkerchief and know that this should be used to prevent the spread of disease. The children should co-operate in keeping the class-room clean and comfortable. A satisfactory condition of air in the class-room is when it is kept in motion without draught and is maintained at a temperature of from 68° to 70° F.

If a child has a cold or is ill, he should remain at home and should be put to bed. If his condition does not clear promptly, a physician should be called. The purpose of this is twofold. A sick child attending school may become chilled or may be subject to changes in temperature which will aggravate his condition. For the sake of other children, an infected child should not be in the class-room. His exclusion from school is a possible protection to other children. Children and parents should be brought to appreciate the value of co-operation in this matter.

Each child should keep a personal record for a school term showing the causes of all absences from school. From this he can compute the number of days he lost on account of colds and other preventable diseases. The

individual records of days lost through colds may be consolidated into a class-room chart, from which graphs may be made. It is interesting to compare the graph for one month with those for the preceding and the succeeding months, also for the corresponding month of the previous year.

The class will be interested in securing a supply of paper handkerchiefs for the class-room. The use of these should be encouraged.

## HEALTH INSTRUCTION IN GRADE VI

The child in Grade VI has a questioning and explorative attitude. He demands definite reasons why certain things are worth doing. He is interested in the various techniques of doing but insists upon knowing why these things are done, and why they are done in certain ways. He will be helped more by personal conferences on matters relating to his personal health than by any class discussion of health practices. The teacher should be prepared to give to the child accurate and scientific information, realizing that none other will satisfy his demand for a rational basis in thinking and doing.

Weighing and measuring continue to be valuable motivations in health instruction. The teacher should encourage participation by the pupils in these activities and every child should now be able to weigh and measure himself accurately. Since many children are sensitive with respect to personal health habits and personal characteristics, the use of class-room charts which reveal personal practices, weights, and heights is open to serious question. Where these charts have been used in the intermediate and senior grades they have been found to cause self-consciousness and undesirable introspection; oftentimes they discourage participation in the health programme of the school. It is, therefore, recommended that their use be discontinued in Grades V and VI. The use of individual charts and graphs which the child keeps as a personal record, and which may be used as the basis for private conferences with the teacher, is recommended. The child should keep these in a health book, which is a record of his health progress throughout the year.

The child is becoming more and more interested in the study of living plants and animals and in natural phenomena. Health instruction should, therefore, be presented through observations and experiments dealing with living things, with special emphasis on problems related to growth and health. This will follow naturally from the nature study which the child has had in the lower grades. He should now deal with such matters as food and its assimilation by plants and animals; respiration of plants and animals; moulds, yeasts, bacteria, and other minute forms of plant and animal life. He should learn that all living things are interdependent, and that he himself is a part of the great world of living things. He should learn that although man is master over other living things, he should use this mastery to promote their well-being rather than to destroy wantonly and inflict unnecessary pain. Thus



he will learn to respect life. He should learn that scientists and investigators are working in special fields of the biological sciences and are making discoveries which affect the daily life of the home, the school, and the community.

The course in Grade VI is planned to serve as an introduction to the health instruction of the senior grades. The teacher must have an accurate knowledge of elementary biology, which is the basic science underlying the course outlined for Grades VI, VII, and VIII. When the child leaves the elementary school, he should have that knowledge which will help him rationalize his health practices so that he may bring these into harmony with scientific and progressive knowledge. His attitudes will emerge from his understanding and appreciation of the contributions of scientists and investigators whose discoveries have made possible the progress of personal and community health.

Every week at least two periods of twenty minutes each should be devoted to direct health instruction. This time will be in addition to that used for experiments, units, enterprises, play, games, and recreation. The programme for this grade presents exceptional opportunities for natural and effective correlations with natural science and social studies. The topics of instruction are listed below.

## I. PLANTS AND ANIMALS THAT LIVE ON LAND

The child observes the various forms of living things seen (a) from the class-room window, (b) on a visit to a farm, (c) on a visit to a park, (d) on a visit to a zoo.

He learns that there are myriads of things that live on the land and that these fall into two great divisions—plant life and animal life (including bird and insect life).

From observation of their modes of living the child discovers that all these forms of life obtain and use food and water; breathe air; give off waste products; produce young forms of life similar to themselves; and are influenced by and respond to things about them. He also learns that all living things need food and water, air, sunlight, and heat.

From observation of various land forms of living things he discovers that each plant or animal has developed special structures and organs which enable it to obtain and use food and water, breathe and use air, get rid of waste products, and produce young similar to itself.

In addition to these characteristics common to all living things, animals, birds, and insects can move from place to place and have developed special structures for this purpose.

From observation the child will learn to distinguish the various special structures or organs and will note what each does to help the particular plant

or animal to live and grow. He will learn that plants have developed roots, branches, leaves, flowers, fruits, and seeds; that animals have developed mouths, noses, heads, legs, and other structures or organs.

The child will learn from observation that various plants and animals depend on one another. They live together and furnish food for one another. Sometimes they live as friends; sometimes they are enemies. He also learns that animals live on plants, and that plants live on food from dead animal life; that some birds live on plant life, such as seeds; that others live on animals, for example, hawks on field mice and other small creatures; that certain birds live on insects; that some plants are the enemies of other plants and crowd them out; that some animals are the enemies of other animals, for example, cats eat mice.

**Activities and Experiments.** The growing of beans, peas, and corn in the class-room will bring to the child's attention the conditions required for the growth of plants; he will also observe the development of the specialized structures—root, stem, and leaf.

He should make a collection of the products of the orchard, the garden, and the field. He should collect fruits, nuts, pods, and seeds, to show the specialized structures of various plants which enable them to produce plants similar to themselves and thus ensure the continuance of this form of life on the earth.

The child should prepare and care for a garden plot. This activity is doubly effective if carried on both at home and at school. The child learns that in order to have plants, seeds must be sown; that seeds will grow into young plants only if food, water, light, heat, and air are present. He learns that a plant has specialized structures—root, stem, branch, leaf, flower, and seed.

Through observation of birds and animals which have been brought to school and cared for by the children under the direction of the teacher, the child learns that these require food and water and have specialized structures for obtaining and using these necessities; that animals need air and have specialized structures for breathing; that they need heat and light of which the sun is the source; that they give off waste materials and have specialized structures for this purpose. The child also learns that animals and birds move about and that each has specialized structures to enable it to do this; that birds and animals rest and sleep, like to be outdoors and to play; and that all these conditions are necessary for their life and growth. The child observes that animals and birds drink milk, eat meat, seeds, grains, and grasses, all of which come from other animals or from plants. The care of animals includes the removal of waste material and the cleanliness of the surroundings.



The needs and characteristics of living things in the insect world may be discovered by observing such common insects as the potato beetle and the caterpillar. A collection of insects should be made by the class, each child contributing to the collection. By means of a magnifying glass the child studies the insect, notes its specialized structures, and sees the relation of these to the life of the insect. Another important and worth-while learning experience will be for each child to make his own insect collection. This he will have at home to study with his parents and other members of the family.

The social life of insects may be studied through observation of the ant and the honey bee.

## II. PLANTS AND ANIMALS THAT LIVE IN THE WATER

The child may observe various forms of living things in a stream, a stagnant pond, a pool, a lake, the ocean.

He learns that there are myriads of living things in water. He learns to distinguish the various forms of animal life, such as fish, crabs, clams, turtles, tadpoles, and water-bugs. He also notes the various forms of water plants—water-lilies, rushes, water crocuses, water-cress, scum, and algae.

From observation the child learns that water animals and water plants possess the characteristics of all living things. Each can obtain and use food, breathe air, give off waste products, and produce young forms of life similar to itself. In addition he learns that water animals can move about from place to place.

He learns that the various water forms of living things need food, air, sunlight, and heat; that each form has developed special structures or organs which enable it to obtain and use food; breathe and use air; get rid of waste products; and produce young similar to itself.

He learns to distinguish these special structures or organs and to note what each does to help life and growth. He learns that water-plants have developed roots, branches, leaves, flowers, fruits, seeds; that water animals have developed mouths, eyes, fins, gills, tails, and other structures and organs.

He discovers that water-plants and water animals depend upon one another, and live together, furnishing food for each other. Sometimes they are friends; sometimes they are enemies.

**Activities and Experiments.** A balanced aquarium is an essential part of the equipment for the study of this topic. It presents opportunities for varied experiments and observations. From it the child may learn the conditions required for the life and growth of water-plants and water animals.

Collections of turtles, lobsters, oysters, clams, crabs, and crayfish will give the child an opportunity to observe the specialized structures of these water animals.

A study of the life cycle of the frog is an interesting learning experience, involving as it does the gathering of the eggs, the proper provision for the hatching of these into tadpoles, and the care of the latter until they have developed into frogs.

### III. SOME OF THE SMALLEST FORMS OF PLANT AND ANIMAL LIFE

From a study of the previous topics the child has learned about living things on land and in the water. His knowledge has come through observation of out-door phenomena and through class-room activities involving the study of living things. He is now familiar with a wide variety of life, from the large fish he may see in a fish shop to the minute minnow which he will find in a near-by stream. He sees that the horse which draws heavy loads has something in common with the small ant whose activities he has studied with the aid of a magnifying glass. He sees that the large elm tree has needs similar to those of the early snowdrop which pushes its head up in the first warm days of spring. All these are forms of living things and every living thing has something in common with every other living thing.

From his observations the child has also learned that there are very small living things. He turns up a stone or a chip and finds under it beetles, earthworms, or green mould-forms. All these are forms of life.

He should use a magnifying glass and become familiar with the increased power of observation which it brings to him.

The story of the discovery of the microscope by Anton van Leeuwenhoek should be introduced. This instrument opens up a world of plant and animal life that cannot be seen by the eye alone. If at all possible the teacher should obtain the use of a microscope. He should make himself familiar with the scientific principle involved and the preparation of slides. Every child should have an opportunity to observe through the microscope minute plant and animal forms. There should be no attempt to introduce scientific names or scientific distinctions in this grade. The child should, however, learn that the plants and animals seen through the microscope are similar to those larger forms with which he is already familiar.

**Activities and Experiments.** Simple experiments involving the growing of moulds and yeasts should be carried on. These should be examined under the magnifying glass. The children should collect mushrooms and puff-balls and other forms of fungus growth for examination under a magnifying glass.

They should also collect algae and the green scum-like material from the surface of stagnant ponds or slow-moving streams, and observe these under a magnifying glass. A bottle of milk should be brought into the class-room and the children should observe the souring process. This souring process is brought about by the growth of minute plant and animal life, commonly known as bacteria.



#### IV. BACTERIA IN RELATION TO OURSELVES

There are a great many forms of bacteria, just as there are many forms of plant and animal life. The child should study some of these minute organisms under the microscope. Although they are so small that they cannot be seen by the eye unaided, these forms of plant and animal life have a definite place in the scheme of things.

There are helpful forms of bacteria which are of vital importance to human life. These include certain yeasts and moulds. There are also forms of bacteria which take substances out of the air and help build up a food supply for other living things.

On the other hand some forms of bacteria are harmful to human life. Certain forms of bacteria destroy food; other forms cause disease.

The use of the microscope should be continued. The story of Louis Pasteur should be introduced as a simple and elementary study. Through this study the child will be able to trace the various steps in Pasteur's investigations and how his knowledge of bacteria increased as he studied the souring of wine, the disease of silk-worms, and sickness among sheep.

**Activities and Experiments.** Growing moulds on bread, cheese, milk, fruit, or vegetables will show the conditions promoting the growth of bacteria. These experiments should be controlled with respect to temperature, light, and moisture. From these the child should study various accepted methods of preservation of foods, such as cold storage and preserving by heat. He should note how these methods are applied to the care of food supplies while in transit by rail and water, and in cold-storage warehouses.

#### V. HOW TO PREVENT BACTERIA FROM HARMING US

Certain types of bacteria bring harm to us because they affect our food. Other harmful bacteria affect us when they enter the body and cause disease. It is important to know scientific methods for the control and destruction of harmful bacteria.

**Care of Food to Prevent Growth of Harmful Bacteria.** Food which is eaten raw should be washed.

Heat destroys harmful bacteria in food. Simple experiments in pasteurizing milk will be found practicable and interesting. The children should, however, understand the difference between boiling and pasteurizing.

Destruction of harmful bacteria in food through cooking may be shown by simple class activities covering the preserving and canning of food.

Other activities to show how harmful bacteria can be prevented from injuring food may be worked out in connection with the drying or dehydrating of certain foods.

Low temperatures are used to control the growth of bacteria in food products. Simple experiments related to the handling and care of milk and other foods in the home should be carried out and observed. Place small quantities of milk in three glass jars. Bring one of these to the boiling point and boil for five minutes; place the second bottle in a refrigerator or, if it is winter, place it outside the window; let the third bottle stand in the room. The pupils should observe and note the time required for the milk in each bottle to sour.

**Care of the Home to Protect Us From Harmful Bacteria.** Soap and water and sunshine are the recognized essentials in keeping our homes clean. Cleanliness in the home includes: cleanliness of the kitchen where food is prepared; cleanliness of the cellar and refrigerator where the food is stored and kept; cleanliness of all persons who handle food in the home; cleanliness of the rooms where people sleep; cleanliness and care of bedclothes; cleanliness and care of the bathroom; collection and disposal of waste material in the home; preventive measures dealing with flies, mice, rats, and other vermin.

**Care of the School to Protect Us From Harmful Bacteria.** Soap and water and sunshine are the recognized essentials in keeping our school clean. Cleanliness in the school includes: cleanliness of cloak-rooms where clothes are hung and lunches are stored; cleanliness of corridors and basements; provision and care of drinking fountains, individual cups, or other drinking facilities; provision of safe drinking water; cleanliness and care of toilets; cleanliness and care of wash-basins; provision for fresh air and sunlight; collection and disposal of waste materials about the school; preventive measures dealing with flies, mice, rats, and other vermin.

**Care of the Body to Protect Us From Harmful Bacteria.** Personal cleanliness includes: washing the hands before handling food; ridding the body of waste materials; keeping the skin clean and healthy; keeping the hair clean.

## VI. HOW WE ARE LIKE OTHER LIVING THINGS

In the earlier topics outlined for this grade, the child has learned that all living things have definite characteristics. He should now learn that we possess like characteristics.

**Activities and Experiments.** From observation of fish and mud-turtles in the school aquarium and of birds, insects, and other forms of animal life the child learns that animals are capable of movement, and that this movement is possible because of the bone-like structures to which is attached muscle tissue. There should be close observation of how movement is effected by animals. We also have bone-like structures to which are attached muscle tissues. Because of these we also may walk, run, climb, jump, and grasp. These special structures of our body, known as bones and muscles, make it possible for us to effect movement.



The child notes that animals rest after movement. It is the same with us. After movement we should rest. We know we need rest because we become tired or fatigued.

From observation of fish in a school aquarium the child notes that fish breathe and that they are provided with special structures for breathing which are called gills. He learns that all living things need air and that he himself needs air. He learns that he has special structures for breathing; his nose for taking in the air; and his lungs for using the air.

From observation under the magnifying glass the child learns of the special digestive structures of certain minute animal forms such as the earth-worm. He also learns that all living things require food and possess special body structures to digest that food. He knows that he himself needs food and he learns that he has special structures to obtain and to digest his food. He learns that his hands help him to secure food. His mouth, teeth, and tongue help him to take the food into his body. He has special structures which enable him to use food for his body needs.

From observation under the magnifying glass the child notes that in all forms of animal life there is a movement of blood throughout the body. He should learn that his blood carries substances from the food he eats and the air he breathes to all parts of his body. He should also learn that the blood carries off waste materials.

From observation of the special structures of animals, including fish, birds, and insects, the child will note the variety of interesting head structures. In the head are found special structures which have to do with seeing, hearing, feeling, and smelling. From these studies of the head and of special senses, the child should be led to a study of the central nervous system, including the brain.

The child has learned that plants and animals give off waste products. He knows also that he himself must get rid of waste matter. In the ordinary course of respiration the out-going air carries certain waste products from the body. The skin helps the body to get rid of certain waste products in the form of sweat. In the food and drink taken in by the body there are waste products which the body does not use. Some of these are solid waste materials and some of them are liquid waste materials. The body must rid itself of these waste materials in order to live and grow.

#### References for the Teacher:

- Berks, R.: *Biology for Senior and Central Schools*. Nelson, Toronto, 1934.  
 Davies and Storr: *Con Moto Rhythmic Series*. Handbook for Seniors. Music in separate volume. University of London Press, 1937. (Clarke, Irwin, Toronto.)  
 Hall, Cyril: *Sea and Its Wonders*. Blackie & Son, Toronto, 1937.  
 Hunt, T. W. and Andrews, H. C.: *Science Activities*. Books 1 and 2. Gage, Toronto, 1936.  
 Hunter, Geo. W. and Whitman, Walter G.: *Science in Our Social Life*. American Book Co., 1935. (Gage, Toronto.)  
 Hunter, Geo. W. and Whitman, Walter G.: *Science in Our World of Progress*. American Book Co., 1935 (Gage, Toronto.)

- Hunter, Geo. W. and Whitman, Walter G.: *My Own Science Problems*. American Book Co., 1935. (Gage, Toronto.)
- Johnson, N. M.: *An Elementary Biology for Schools*. Oliver, 1934. (Clarke, Irwin, Toronto.)
- Little, W. B.: *Science and Living Things*. Pitman, Toronto, 1931.
- MacKinnon, Doris L.: *The Animals' World*. G. Bell & Sons, Ltd., 1936. (Clarke, Irwin, Toronto.)
- Peabody and Hunt: *Biology and Human Welfare*. Macmillan, Toronto, 1935.
- Pfaffman and Stern: *Food and Your Body*. Barrows, Boston, 1932.
- Pieper and Beauchamp: *Everyday Problems in Biology*. Scott, 1934. (Gage, Toronto.)
- Shoosmith, F. H.: *Life in the Animal World*. Harrap, 1932. (Clarke, Irwin, Toronto.)
- Shoosmith, F. H.: *Life in the Plant World*. Harrap, 1932. (Clarke, Irwin, Toronto.)
- Williams, S. H.: *The Living World*. Macmillan, Toronto, 1937.
- Wilson, Wilson, and Erb: *Richer Ways of Living*. American Book Co., 1937. (Gage, Toronto.)

### References for the Pupils:

- Andress and Goldberger: *Broadcasting Health*. Ginn, Montreal, 1933.
- Andress and Goldberger: *The Health School on Wheels*. Ginn, Montreal, 1933.
- Andress and Evans: *Health and Success*. Ginn, Montreal, 1933.
- Athey, Lillian Cox: *Along Nature's Trails*. American Book Co., 1936. (Gage, Toronto.)
- Beauchamp, Melrose and Blough: *Discovering Our World*. Science Stories, Book IV. Gage, Toronto, 1937.
- Bool, Charles J.: *The World at Work*. Book II, Pitman, Toronto, 1936.
- Brooks, Leonard, and Finch, Robert: *Many Things from Many Lands*. University of London Press, 1935. (Clarke, Irwin, Toronto.)
- Brownell, Ireland and Giles: *Everyday Living*. Rand McNally, 1935. (Gage, Toronto.)
- Charters, Smiley and Strang: *Health Problems*. Macmillan, Toronto, 1936.
- Charters, Smiley, and Strang: *Wise Health Choices*. Macmillan, Toronto, 1935.
- City and Country Series: *The Story of Market, The Story of Bread, The Story of Textiles, The Story of Milk, The Story of Cotton, The Story of Transportation*. Harper, 1937. (Clarke, Irwin, Toronto.)
- Coles, L. A.: *Plain Science*. Collins, Toronto, 1937.
- Cons, George: *Golden Hind Geographies, First series*. Book II, *Village Peoples*; Book IV, *Man's Work in the World*. University of London Press, 1937. (Clarke, Irwin, Toronto.)
- Craig, Gerald S., Hurley, Beatrice Davis: *Earth and Living Things*. Ginn, Montreal, 1932.
- Craig, Gerald S. and Condroy, Margaret G.: *Learning About Our World*. Ginn, Montreal, 1932.
- Craig, Gerald S. and Baldwin, Sara E.: *Our Wide, Wide World*. Ginn, Montreal, 1932.
- Davis, Dorothea H.: *How the World Supports Man*. Follett, 1931. (Moyer, Toronto.)
- de Wolfe, L. A.: *Happy Hours in Garden, Field, and Woodland*. Dent, Toronto, 1934.
- Duncan, F. Martin, and Duncan, L. T.: *Story of the Plants*. Oxford University Press, 1936. (Clarke, Irwin, Toronto.)
- Duncan, F. Martin and Duncan, L. T.: *Wonders of Insect Life Series*. *Bees, Wasps and Ants*, 1936; *Beetles and Flies*, 1931. Oxford University Press, (Clarke, Irwin, Toronto.)
- Eliot, Margaret M. and Leeds, E. J.: *Farmers Through the Ages*. Arnold & Son, 1937. (Macmillan, Toronto.)
- Fowlkes, Jackson and Jackson: *Keeping Well*. Winston, Toronto, 1936.
- Fowlkes, Jackson and Jackson: *Healthy Living*. Winston, Toronto, 1936.
- Fry, Margaret: *Man and His Customs*. Follett, 1934. (Moyer, Toronto.)
- Gall, Alice, and Crew, Fleming: *Little Black Ant*. Oxford University Press, 1936. (Clarke, Irwin, Toronto.)
- Gask, Lilian: *All About Animals from A to Z*. Harrap, 1934. (Clarke, Irwin, Toronto.)
- Golden Nature Readers: *Book II*, 1937; *Book III*, 1935; *Book IV*, 1935. University of London Press. (Clarke, Irwin, Toronto.)
- Golden Science Series: *Book II*, 1935; *Book III*, 1937. Knight, Elsie V. M. University of London Press. (Clarke, Irwin, Toronto.)
- Hunt and Andrews: *Science Activities*. *Books I and II*. Gage, Toronto, 1936.
- Little, W. B.: *Nature All Around Series*. *Book I*, 1935; *Book II*, 1935; *Book III*, 1936. Pitman, Toronto.
- Little, W. B.: *Science for Junior Schools*. *Books I and II*, 1936; *Books III and IV*, 1935. Pitman, Toronto.
- Mackinnon, Doris L.: *The Animal's World*. Bell, 1936. (Clarke, Irwin, Toronto.)
- Mann and Hastings: *Out of Doors*. Holt. (Clarke, Irwin, Toronto.)
- McGill, Janet: *The Garden of the World*. Follett, 1936. (Moyer, Toronto.)



- Nature Series: *By Seaside and Wayside. Book I: Some Animals and Their Homes*, 1937; *Book II: Some Animal Neighbours*, 1937; *Book III: Plants and Animals*; *Book IV: Our Earth and its Life*, 1936. Heath. (Copp, Clark, Toronto.)
- Patch, Edith M. and Howe, Harrison, E.: *Nature and Science Series. Surprises: Science at Home; Through Four Seasons*. Macmillan, Toronto. 1936.
- Persing and Peebles: *Elementary Science by Grades. Books III, IV and V*. Appleton-Century, 1935. (Ryerson, Toronto.)
- Powers, Margaret: *World of Insects*. Follett, 1931. (Moyer, Toronto.)
- Rice, Wood, Phelan, and Lambkin: *Many Ways of Living*. Nelson, Toronto, 1936.
- Rice, Wood, Phelan, and Lambkin: *Keeping Fit*. Nelson, Toronto, 1936.
- Simpson and Smith: *The Body and Health*. Ryerson, Toronto, 1937.
- Simpson and Smith: *Building for Health*. Ryerson, Toronto, 1937.
- Stephenson, Mary Bowen: *World of Animals*. Follett, 1934. (Moyer, Toronto.)
- Stephenson, Mary Bowen: *World of Invisible Life*. Follett, 1934. (Moyer, Toronto.)
- Teeters, W. R. and Heising, Clara M.: *Early Journeys in Science*. Lippincott, 1931. (Longmans, Green, Toronto.)
- Turner and Collins: *Cleanliness and Health*. Heath, 1937. (Copp, Clark, Toronto.)
- Turner and Collins: *Health*. Heath, 1937. (Copp, Clark, Toronto.)
- Weinberg, Scott, and Holston: *The World We Live In*. Heath, 1932. (Copp, Clark, Toronto.)
- Wilson, Wilson, and Erb: *Ways of Living in Many Lands*. American Book Co., 1937. (Gage, Toronto.)
- Wilson, Wilson, and Erb: *Where Our Ways of Living Come From*. American Book Co., 1937. (Gage, Toronto.)
- Winslow and Hahn: *The Game of Healthy Living*. Merrill, 1932. (Clarke, Irwin, Toronto.)
- Winslow and Hahn: *The Habits of Healthy Living*. Merrill, 1932. (Clarke, Irwin, Toronto.)

## CHAPTER XVI

### HEALTH INSTRUCTION IN GRADES VII AND VIII

In Grades VII and VIII the child is at the early adolescent stage. He is becoming increasingly conscious of himself as a member of a social group. He is interested in aspects of social life and the part he himself will play in various community associations. He desires to fit into various social groups. He wishes to be liked by others and to achieve success in associating with others. His health education should be based upon these new interests and motives which now emerge and which determine his health behaviour.

Certain personal and social characteristics are now manifesting themselves as dominant influences in the child's life. The integration of these becomes the basis of his personality. Health education should seek to give the child the means of working out desirable traits of personality which will carry over into his adult life and make it possible for him to attain happiness as an individual and as a member of society. He is interested in gaining a mastery over his body functions and in knowing scientific facts of physiology not as names but as a means of helping him solve his own problems. He is interested in those which have a bearing upon his success in athletic games and in special fields of life work which now begin to attract his attention. He is also interested in those matters which contribute to mental efficiency, self-control, and feelings of mental and social adequacy. He is interested in those problems which will help him make desirable social adjustments. Mental health should be presented in such a way that the child sees its direct application to his personal problems of adapting himself to meet new, complex, and ever-changing situations in his social, economic, and moral environment. The child should gain an appreciation of the basic scientific knowledge which contributes to his health. He should know that this knowledge is constantly changing and enlarging. He should be given the skills and tools by which he may acquire basic scientific knowledge for himself.

The child has already spent six years in the elementary school, during which time emphasis has been placed on the development of desirable health habits. It should not, therefore, be necessary in these grades to organize activities for, nor to spend class time on, instruction relating to the development of health habits. Health instruction should provide the scientific basis which will give satisfactory reasons for keeping up health practices. Through a study of individual surveys the teacher will discover the health needs of each child. If a child needs special direction in health practices, this should be



given personally. There will be some children who come from classes where there has been no progressive health education. These will require personal direction and simple instruction relating to the techniques and reasons for health habits which they should have received in the junior and intermediate grades. The teacher in Grades VII and VIII, however, should regard these as individual and special cases. They should not be allowed to interfere with the continuity of health education designed for the class as a whole.

The organization of the school on the principles of healthful school living is essential in these grades. The stress of examination subjects and the tendency on the part of some teachers to regard the health of the child as of casual importance oftentimes results in pressures and strains which have serious effects upon the child's health. The teacher should not overlook the necessity for relaxation periods, recreation and play activities, and pupil participation and responsibility in school organization. He should guard against limiting opportunities for play out-of-doors by detention at recess and after school, and by excessive home-work assignments.

Instruction involving simple experiments which marked the procedures in Grade VI should be continued throughout Grades VII and VIII. The teacher is referred to the chapter on Materials in this connection. The instruction should be based upon observation, experimentation, and activities rather than upon formal teaching. In this way the school provides opportunities whereby the child may learn, not only the results of scientific discovery, but something of the problems and procedures involved in scientific investigation.

The correlation of health instruction with natural science, social studies, English, household science, manual training, music, and art will unify learning for the child. From these subjects contributions may be drawn from wide areas of experience all of which bear a definite relation to the child's health needs and problems.

There should be at least two half-hour periods each week in Grades VII and VIII for Health Instruction. This will include pupil participation in experiments and in activities involving planning, creating, and assembling of materials. These instruction periods should be in addition to the time devoted to relaxation, recreation, games, and physical activities.

The teacher must possess a background of scientific and accurate knowledge related to physical, mental, emotional, and social health. The teacher of arithmetic has prepared himself through a study of algebra, geometry, and trigonometry. So the teacher of health in these grades must have a background of biology and bacteriology, physiology, including nutrition; anatomy and hygiene; psychology, with special reference to mental and emotional well-being; sociology with its contribution to an understanding of the laws of social health. He must realize that the discoveries of the scientist are constantly enlarging, changing, and modifying our knowledge in such matters.

The teacher should measure the effectiveness of health education, not in terms of information which may be tested by formal examinations, but rather by the extent to which each pupil is increasing and sustaining his capacity for adaptive effort when faced with new problems.

The progress of each child should be noted as he rationalizes his health practices through scientific knowledge and develops intelligent attitudes towards matters of health. Many personal problems will require home co-operation. By securing this the teacher will make a valuable contribution to the well-being of the child.

The child should make surveys of his own health practices during each year. The first survey should include a study of his health behaviour over a 24-hour period. It should be made early in September and will be a guide to him in checking his health practices. In order that he may measure his progress during the year a similar 24-hour survey should be made some time in May. These surveys should be compared. The first survey will show him his personal health needs. The second survey will show him the improvement he has made in his attempts to meet these needs. These surveys are personal and should not be made the subject of class discussion.

Because of the limitations of a survey covering the 24-hour period it is desirable that the child some time during the fall term should record his health behaviour over the period of a week. The diary form may be used for this survey, which should reveal whether his plan of living over this period is well balanced. The teacher should discuss the diary with each child. A similar diary should be made towards the end of the school year for purposes of comparison. There are many children whose school life ceases at the end of Grade VIII, and for these children it is especially important that they understand the desirability of devising and carrying out a plan of living that will include every aspect of physical, mental, emotional, and social health. Care should be taken that the child does not become morbidly self-conscious or introspective in regard to personal health. The teacher should not lose sight of the fact that health is a quality of life which increases one's capacity for varied activity, with resultant feelings of happiness, security, and adequacy.

**Recreational and Physical Activities.** Games provide physical activity for the child. Through them he learns the performance of certain movements involving skills and techniques. At this age he becomes interested in others and he must learn the essential principles of happy co-operation with others. Group and team games involve the observance of specialized rules by those participating. The enjoyment of such games demands that participants must alternate as followers and leaders. Group games include chasing or tag games, relay games, and circle games, all of which are easily learned and require simple organization. Team games include volley-ball, nine-court basket-ball, soft-ball, hockey, and cricket.



The value of such games cannot be overemphasized in their contribution to social and emotional health. The child must learn to follow rules when these contribute to the happiness of the group. He must learn to take responsibility when this enhances the success of the game. He must learn to take reverse, since a team game which is played with continuous success for one side loses interest, not only for those who are winning but also for those who are losing. If games are fairly played, the child gains learning experiences from defeat as well as from success.

Group and team games, however, must be supplemented by individual games such as tennis, badminton, handball, quoits, horseshoes, archery, and ping-pong, which appeal to the child who is not sympathetic to large group efforts. This type of recreational activity should also provide for those pupils whose capacity is not equal to that of the class group.

In planning the programme for the year the teacher should also provide for seasonal activities such as gardening, hiking, skipping, fishing, skating, sleighing, tobogganing, skiing and, wherever facilities are available, aquatic activities such as swimming, diving, water-games, and boating. Rhythmic games such as singing-games, folk-dancing, tap and character-dancing should also be included.

Natural exercises based on the child's inherent interests in such activities as running, jumping, climbing, and throwing should also be encouraged. Examples of these are the running and chasing games, tumbling stunts such as hand-stands, cartwheels, and free exercise on ropes and on parallel and horizontal bars.

In his diary the child should record the various games which he plays, whether these are group, team, or individual games, rhythmic, seasonal activities, or natural exercises. He should note the position which he has occupied in each group, and he should be able to check his achievement in his various positions. He should be encouraged to learn new games, not only those played under the instruction of the teacher, but also those which he may learn from books or from another child. After he has learned such a game, he should be encouraged to teach it to others.

The teacher should stress those activities which are suited to the individual child and to the conditions of the school. Emphasis should also be given to those which are based on free and spontaneous movements and which are recreative and interesting. There will be a carry-over into intermission and after-school playtime of those activities which have brought enjoyment and satisfaction. It is desirable that the participation of the child in worth-while physical activities should carry over into the leisure of adult life. The child who has not learned to play should be encouraged by the teacher to take part in those activities from which he secures some measure of success and satisfaction so that he will, of his own choice, seek further experience in recreation.

## HEALTH INSTRUCTION IN GRADE VII

Health instruction in Grade VII has as its aim the development of an integrated personality, possessing character and capacity for purposeful and harmonious living. The child should be led to regard the body as a complete and unified whole. The scientific knowledge should be within his comprehension and should be presented in terms of body functioning and care rather than in the technical terms of physiology and anatomy. The presentation should be through experiments and observations. Such information will have scientific validity. The conclusions which the child arrives at should come to him in such a way that he does not accept them with absolute finality but retains an attitude of open-mindedness.

To meet the learning needs of the child the subject is presented through topics which deal with the various aspects of the body as a living organism. Throughout the course for this grade, emphasis should be placed on the interrelation and interdependence of the various systems of the body.

Recurrent reference is made to the biological sciences. In Grade VI the child was first given an understanding of the relation of biology to health and this is now carried forward in the course for Grade VII. The topics for the year are listed below. Much of the work of this grade is dependent upon an elementary knowledge of the sciences. The teacher is, therefore, referred to books on biology, physics, chemistry, and physiology.

### I. THE BODY AND HOW IT GROWS

A study of the living cell: what it is made of.

The characteristics of the cell: assimilates food; breathes air; gives off waste products; is capable of movement; needs rest; and reproduces its kind. Different types of cells; groups of cells form tissues; tissues form organs or structures; related structures or organs form systems of the body.

Interrelation of all the systems of the body.

A study of the framework of the body: bones of the skeleton held together by ligaments.

Structure and composition of bones; cartilage; joints and tendons; how a joint works.

The framework determines the shape and the size of the body.

Function of the framework: provides for the attachment of the muscles and the placement and protection of the vital organs.

A study of the skin; its composition.

Functions of the skin: to cover the body, and to protect it from injury and from entrance of infection; to aid the body in the excretion of waste materials and in the control of body temperature; through the sense of touch, to bring the individual into contact with objects of the outside world.

The hair and nails as modifications of the skin structure.



## II. HOW THE BODY USES FOOD

A study of the food needed by the body for growth and functioning.

How various foods meet these needs.

How food is changed so that it may be used by the body.

Specialized structures and organs of the body that bring about changes in food.

How these specialized structures work together; the digestive system.

Structures and organs of the digestive system; their functions and their care.

How the digestive system works in harmony with the other systems of the body.

## III. HOW THE BODY USES AIR

A study of the air needed by the body for growth and functioning.

Gases contained in the air taken into the body.

Gas used by the body; oxidation; change in the composition of air within the body.

Gases contained in the air breathed out.

Process of respiration includes exchange of gases of the air within the lungs and exchange of gases between the blood and the cells.

Specialized structures and organs which enable the body to take and to use oxygen from the air.

How these specialized structures and organs work together; the respiratory system.

Structure and organs of the respiratory system; their functions and care.

How the respiratory system works in harmony with other systems of the body.

Conditions of the air for comfort and health; ventilation.

## IV. WHAT THE BLOOD DOES FOR THE BODY

A study of how food is supplied to the cells of the body.

How oxygen is carried from the lungs to the cells.

How waste products are carried from the cells to the skin, the kidneys, and the lungs.

How the blood helps to maintain the normal temperature of the body.

How the blood helps to protect the body against bacteria.

Composition of the blood.

Specialized structures and organs which provide for the circulation of the blood to all parts of the body.

How these specialized structures and organs work together; the circulatory system.

Structures and organs of the circulatory system; their functions and care.

How the circulatory system works in harmony with other systems of the body.

## V. MOVEMENT OF THE BODY AND ITS PARTS

A study of the movement by the body shows: that the body is capable of locomotion; that movement takes place in certain regions of the body without any conscious effort, for example, the heart beating, the lungs expanding and contracting, etc.; that movement takes place in certain other regions of the body after conscious effort, for example, the arm is lifted, the leg is bent, etc.

Specialized structures are required for body movement of any type. The specialized structures which make body movement possible work together and are known as the muscular system.

The muscles: what they are made of; their function and their care.

How physical activity affects the muscles; increased efficiency; fatigue. How the nervous system works in the control of the entire muscular system. How the muscular and nervous systems work in harmony with the other systems of the body.

## VI. HOW THE BODY RIDS ITSELF OF WASTE PRODUCTS

A study of how the body throws off waste materials.

All living matter is constantly changing and this action means renewal of tissue, or substituting new material for old. The old material must be discarded. Like all living things the body possesses the characteristic function of getting rid of waste products.

Of the food taken in, the body uses certain substances and rejects others.

Of the air taken in, the body uses certain substances and rejects others.

The rejected substances and the materials discarded in renewal of the tissues are thrown off by the body through specialized structures and organs. A study of the process of elimination through the lungs, skin, intestines, and kidneys.

Care of the body through external and internal cleanliness to ensure proper functioning of the organs of elimination.

The influence of the functioning of the various systems of the body on the elimination of waste.

## VII. A HEALTHY PERSONALITY

A study of the nervous system—the control centre of all mental and physical activity; the specialized structures and organs that provide for co-ordination and control of activity.

How these specialized structures and organs work together; the central nervous system.

Structures and organs of the nervous system; their functions and their care.

How the nervous system acts as a control over all other systems of the body.



How the nervous system works in harmony with all other systems of the body.

The relation of sleep, rest, relaxation, and physical activity to the nervous system.

How self-control aids in the development of a healthy personality; alcohol and tobacco.

How recreative leisure activities and hobbies contribute to physical, mental, emotional, and social health.

The interdependence of personality and health.

Discovery on one's own capabilities and limitations and the adjusting of one's life in harmony with these.

## VIII. HOW WE LEARN OF THE WORLD ABOUT US

A study of the special senses.

Learning through the special sense organs of sight, hearing, touch, taste, and smell.

Learning through sound and the voice.

Certain parts of the body are sensitive to external stimuli of specific types.

One part is sensitive to light, and the specialized structure or organ is called the eye.

The part sensitive to sound waves is the specialized structure or organ known as the ear.

Other specialized structures take care of the sense of taste, the sense of touch, and the sense of smell.

These specialized structures which are called the organs of special sense receive stimuli from the outside world. The nerve cells of these organs become modified and specific impulses are transmitted to the brain through the nervous system.

Through his senses, the individual gains a knowledge of the world about him. Learning is, therefore, dependent upon the functioning of the sensory apparatus. The ability to learn remains constant for any individual. The speed with which a student learns and the amount learned are immediately and seriously affected by any impairment in the functioning of the sensory apparatus of sight and hearing. Any such impairment becomes a handicap to the student in the class-room and, after he leaves school, in his life work.

A study of the special sense of sight which enables the individual to gain a knowledge of the outside world in terms of light, colour, form, and depth.

The specialized structures and organs of vision; their functions and care.

Impairment of the functioning of these specialized structures; adjustment and possible prevention; social and economic results of total or partial loss of sight.

A study of the special sense of hearing which enables the individual to gain a knowledge of the outside world in terms of sound so that he may learn to speak, to know language, music, and other sounds.

The specialized structures and organs of hearing; their function and care.

Impairment of the functioning of these specialized structures; causes; possible prevention and adjustment; social and economic results of total or partial loss of hearing.

Many defects of vision and hearing are remediable and capable of adjustment. The teacher should help the child to understand the importance of attaining and maintaining a maximum functioning of the organs of sight and hearing. Any difficulty affecting the child's progress should be noted and should be followed by an appraisal of the functioning of his sight and hearing. A child who withdraws from personal responsibility and social participation because of the impairment of these functions should be tactfully led by the teacher to appreciate the importance of having remedial treatment so that he may pursue a normal life with other children.

A study of the organs of speech, their function, and care.

The organs of speech are not sensitive to external specific stimuli. The voice is, however, so closely connected with hearing that speech and hearing are usually studied together. The age at which loss of hearing occurs affects the power of speech. Children born deaf are invariably mutes; children who lose their hearing before the third year also lose the power of speech.

A study of other parts of the sensory apparatus, namely, the specialized structures sensitive to touch, to taste, and to smell.

The functions and care of the various organs and structures of touch, taste, and smell.

## IX. FIRST AID AND RESUSCITATION, HOME NURSING, AND CHILD CARE

Students of both sexes should receive instruction in these subjects. The instruction is based upon technical procedures and should be given by qualified and trained persons. It is usual for the teacher to secure the co-operation of professional services, medical and nursing, for this part of the year's work. The teacher is referred to Chapter X.

## X. SAFETY IN SCHOOL, HOME, AND COMMUNITY

Safety in play: playing carefully when swimming, skating, tobogganing, boating, and participating in other active sports; safety depends upon skill of the participant as well as upon choosing safe places in which to play.

Protection for the player by provision of an appropriate outfit, with particular emphasis on protection of the vulnerable parts of the body. Responsibility of the participants to provide for the safety and protection of non-participants from the hazards of the game.



A study of safety precautions in hiking, camping, and scouting. This will include the ability to recognize poison ivy; to provide safe water for drinking; and to know how to light and extinguish camp fires.

A study of accidents in the community according to type, location, and frequency; causes and preventive measures.

A survey of areas in the community presenting special hazards from motor vehicles and railway trains.

A study of accidents in the homes of the community by sex and age of victim; cause, and possible prevention.

An analysis of accidents in Ontario and in the Dominion of Canada.

The responsibility of the individual in the prevention of motor accidents through carelessness while riding on buses, trains, street cars, bicycles, etc.

## HEALTH INSTRUCTION IN GRADE VIII

### COMMUNITY HEALTH

Health Instruction in Grade VIII deals with Community Health. Throughout the grades of the elementary school the child has developed a gradually enlarging concept of the meaning of community. In the junior grades the community meant his immediate family together with his intimate associations in the school and in the church. Later he gained a wider idea of community through a study of his immediate social environment, the town, the city, the Province, and the Dominion of Canada. In the senior grades social studies led him to a still broader conception of community. He discovered the interdependence of countries and peoples. In the earlier grades emphasis was placed upon the health of the individual but even in those grades it became apparent that the health of the individual was bound up with that of other people. Where people work and live together, whether it be in a rural community, a small urban community, or a large city, a province, or a country there are intimate and very complex economic and social relationships. The health of the individual is, therefore, inextricably bound up with the health practices, health knowledge, and health attitudes of others. Community health will deal with varied areas of health activities. It will include such problems as the local provision for safe drinking water; the Provincial distribution of biological products for the prevention and control of communicable disease in the various municipalities; the federal health inspection services relating to immigration.

The teacher should be familiar with the contribution of the biological sciences to the promotion of health and the prevention and control of disease. In Grade VI the child was first given an understanding of the relation of biology to health and this was carried forward in Grade VII in a study of *The Elementary Facts of the Body and Its Functions*. Community health is based upon the application of principles evolved from the biological sciences.

Research workers continue to modify and enlarge the content of these basic sciences.

Since many children complete their school education at the end of Grade VIII, it is essential that the teaching throughout the senior grades impress upon the students the importance of retaining an open mind and a receptivity to scientific discoveries. The teaching should show the need of appraising the accuracy of these discoveries by reference to recognized and authoritative sources and agencies. It should also show the importance of applying accurate and scientific knowledge to problems related to their own physical, mental, emotional, and social health. The influence of the teacher will be most important in building up and determining the attitudes of the students. The teacher should, therefore, keep himself informed of the progress of the biological sciences and their contributions to personal and community health.

The topics for the year are listed below. Emphasis should be placed upon the health services rendered by the various community health agencies. If this is done, the child will realize that these services contribute to the well-being of the people and the welfare of the community and he will carry this attitude into his adult life. The presentation should be through practical experiments and observation. Field trips which may include visits to a park, a museum, a zoo, an art gallery, a swimming pool, a playground, a dairy farm, a pasteurization plant, a water-works plant, a sewage disposal plant, an abattoir, a cheese factory, a restaurant, a market, a laundry, a creamery, and a bakery should be a recognized part of the health instruction. A field trip should not be taken until adequate preparation has been made and the children understand what they are going to see. Thus the field trip becomes part of the activities associated with a particular topic. Certain questions will be answered through the visit, and a properly organized field trip should lead the children to study and to make further investigations for themselves. Perhaps the most important contribution of a field trip is the fact that the child discovers that what he studies in school is part of the everyday life of men and women, and that it is definitely connected with the health of the community. The teacher is referred to books on elementary biology and community health.

### I. A SAFE WATER SUPPLY

A study of the elementary facts relating to the provision of a safe water supply for the home, school, and community, with a justification from a scientific basis of the various procedures in the collection, the treatment, and the distribution of water.

### II. DISPOSAL OF SEWAGE AND WASTE

A study of modern methods of disposal of sewage and waste materials in the community, the home, and the school, with reference to the scientific basis for the various procedures.



### III. HEALTH PROTECTION OF FOOD SUPPLIES

A study of the measures for protecting the food supplies, other than water and milk, in the community.

### IV. A SAFE MILK SUPPLY

A study of the provisions whereby a safe milk supply is made available to the community and the home, with special reference to the scientific basis of the various procedures in the production, processing, and distribution of milk.

### V. THE PREVENTION AND CONTROL OF DISEASE

A continuation of the study of bacteria which was begun in Grade VI; the role of bacteria in relation to disease, with special reference to certain communicable diseases, their causes, spread, prevention, and methods of control.

### VI. COMMUNITY HEALTH SERVICES

A study of the organization and responsibilities of various community health services, including school health services; other municipal health services; provincial health services; federal health services; and international health services.

### VII. FIRST AID AND RESUSCITATION, HOME NURSING, AND CHILD CARE

Students of both sexes should receive instruction in these subjects. The instruction is based upon technical procedures and should be given by qualified and trained persons. It is usual for the teacher to secure the co-operation of professional services, medical and nursing, for this part of the year's work. The teacher is referred to Chapter X.

### VIII. SAFETY AND HYGIENE OF ENVIRONMENT

A study of the home in both rural and urban communities, with special reference to modern sanitation, safety, and recreational facilities for children and adults.

A study of elementary facts relating to housing and community planning.

A study of safety and hygiene in modern industry as applied especially to agriculture, lumbering, mining, fishing, manufacturing, transportation, and commerce.

A study of safety measures and sanitation in various types of modern transportation.

A study of safety and sanitation in camps and summer resorts.

## IX. WHAT THE COMMUNITY DOES TO PROMOTE THE HEALTH OF THE INDIVIDUAL

A study of modern cultural, recreational, and other community services for the promotion of the well-being of the citizen.

### References for the Teacher:

- Baker and Mills: *Dynamic Biology*. Rand McNally, 1933. (Gage, Toronto.)  
 Berks, R.: *Biology for Senior and Central Schools*. Nelson, Toronto, 1934.  
 Brandreth, Gordon: *Canadian Book of Games*. Ryerson, Toronto, 1931.  
 Bush, George L., Ptacek, Theodore W., and Kovats, John, Jr.: *Senior Science*. American Book Co., 1937. (Gage, Toronto.)  
 Curie, Eve: *Madame Curie*, translated by Vincent Sheean. Doubleday, Doran, Toronto, 1937.  
 Davies and Storr: *Con Moto Rhythmic Series*. Handbook for the Senior Schools. Music in separate volume. University of London Press, 1937. (Clarke, Irwin, Toronto.)  
 Hallock and Turner: *Louis Pasteur*. Heath, 1928. (Copp, Clark, Toronto.)  
 Heiser: *An American Doctor's Odyssey*. W. W. Norton Co., 1936. (Geo. J. McLeod, Toronto.)  
 Little, W. B.: *Short Course in Biology*. Pitman, Toronto, 1936.  
 Little, W. B.: *Science and Living Things*. Pitman, Toronto, 1931.  
 Peabody and Hunt: *Biology and Human Welfare*. Macmillan, Toronto, 1935.  
 Pieper, Charles John, and Beauchamp, Wilbur Lee: *Everyday Problems in Science*. Gage, Toronto, 1936.  
 Pieper, Charles John, and Beauchamp, Wilbur Lee: *Everyday Problems in Biology*. Scott, Foresman, 1934. (Gage, Toronto.)  
 Smiley and Gould: *A College Textbook of Hygiene and Community Hygiene*. Macmillan, Toronto, 1935.  
 Watkins, Ralph K., and Bedell, Ralph C.: *General Science for To-day*. Macmillan, Toronto, 1936.  
 Williams, Jesse Feiring: *Healthful Living*. Macmillan, Toronto, 1936.  
 Williams, Samuel H.: *The Living World*. Macmillan, Toronto, 1937.  
 Wilson, Wilson, and Erb: *Richer Ways of Living*. American Book Co., 1937. (Gage, Toronto.)

### References for the Pupils:

- Andress and Evans: *Healthy Citizenship*. Ginn, Montreal, 1931.  
 Brownell, Ireland, and Giles: *Helpful Living*. Rand, McNally, 1935. (Gage, Toronto.)  
 Brownell, Ireland, and Towne: *Progress in Living*. Rand, McNally, 1935. (Gage, Toronto.)  
 Brownell, Ireland, and Towne: *Science in Living*. Rand, McNally, 1935. (Gage, Toronto.)  
 Burkard, Chambers & Maroney: *Personal and Public Health*, 1936. Ryerson Press, Toronto.  
 Charters, Smiley & Strang: *Adventures in Health*, 1935. Macmillan Co., Toronto.  
 Charters, Smiley & Strang: *Health Knowledge*, 1935. Macmillan Co., Toronto.  
 Coles, L. A.: *Plain Science*. 1931. Collins, Toronto.  
 Fowlkes, Jackson, and Jackson: *Healthy Living*. Winston, Toronto, 1936.  
 Fowlkes, Jackson, and Jackson: *Making Life Healthful*. Winston, Toronto, 1936.  
 Fowlkes, Jackson, and Jackson: *Success Through Health*. Winston, Toronto, 1936.  
 Holway, Hope: *The Story of Health*. Harper, 1931. (Clarke, Irwin, Toronto.)  
 Holway, Hope: *The Story of Water Supply*. Harper, 1929. (Clarke, Irwin, Toronto.)  
 Hunter and Whitman: *My Own Science Problems*. American Book Co., 1935. (Gage, Toronto.)  
 Hunter and Whitman: *Science in Our World of Progress*. American Book Co., 1935. (Gage, Toronto.)  
 Hunter and Whitman: *Science in Our Social Life*. American Book Co., 1935. (Gage, Toronto.)  
 Knight, Elsie V. M.: *The Golden Science Series. Books I, II and III*. University of London Press. (Clarke, Irwin, Toronto.)  
 Little, W. B.: *Science and Health*. Pitman, Toronto, 1935.  
 Little, W. B.: *Science in the Home*. Pitman, Toronto, 1935.



- Mackinnon, Doris L.: *The Animal's World*. G. Bell and Sons, 1936. (Clarke, Irwin, Toronto.)
- Nida and Holmes: *The Ladder of Life*. Heath, 1930. (Copp, Clark, Toronto.)
- Patch and Howe: *Work of Scientists*. Macmillan, Toronto, 1935.
- Persing and Hollinger: *Elementary Science by Grades. Book VI*. Appleton-Century, 1933. (Ryerson, Toronto.)
- Pollock, Janet: *This Physical World*. Follett, 1936. (Moyer, Toronto.)
- Rice, Wood, Phelan, and Lambkin: *Blazing the Trail*. Nelson, Toronto, 1936.
- Rice, Wood, Phelan, and Lambkin: *How We Live*. Nelson, Toronto, 1936.
- Stowell, Thora: *The Book of Animal Life*. Harrap, 1935. (Clarke, Irwin, Toronto.)
- Turner, C. E.: *Physiology and Health*. Heath, 1935. (Copp, Clark, Toronto.)
- Turner and Collins: *Community Health*. Heath, 1935. (Copp, Clark, Toronto.)
- Williams, Jesse Feiring: *Health and Ideals*. Sanborn, 1936. (Clarke, Irwin, Toronto.)
- Wilson, Wilson, and Erb: *Living in the Age of Machines*. American Book Co., 1937. (Gage, Toronto.)
- Winslow and Hahn: *The Laws of Healthy Living*. Merrill, 1932. (Clarke, Irwin, Toronto.)
- Winslow and Hahn: *The Healthy Community*. Merrill, 1934. (Clarke, Irwin, Toronto.)

# PART III

## SCIENTIFIC AND TECHNICAL INSTRUCTION FOR THE TEACHER

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### CHAPTER XVII

## THE HUMAN BODY—ITS ANATOMY, PHYSIOLOGY, AND GROWTH

**Historical Reference.** The science of biology is age old. Ancient physicians discovered and recorded certain facts about the human body and other living organisms. But so long as the scientist had to depend for his investigations upon the limited power of his unaided senses little real progress was possible. In the middle of the 17th century, however, Leeuwenhoek revolutionized the science of biology by his invention of that combination of lenses known as the microscope. This instrument made possible the investigation, not only of the origin of disease, but also of the composition of living matter. The development of scientific instruments and scientific technique during the last hundred years has brought to its present stage of advancement our knowledge of biology, anatomy, and physiology.

**The Cell.** The cell is the smallest unit of living matter. Millions of cells, massed together in complex and varied combinations, make up the organs of the human body.

**Anatomy of the Cell.** Cells vary in size, shape, and function, but the principle underlying their structure is almost always the same. Each cell is composed of a gelatinous substance known as protoplasm, surrounded by a protective membrane. Protoplasm is simply living material. Its exact constitution is unknown; but it is believed to consist of an aqueous colloidal solution of proteins, lipins, carbohydrates, and inorganic salts, which are physically and chemically combined in many ways, and which change from time to time. Contained within the cell is the nucleus, which is its controlling mechanism. Within this nucleus are found tiny granules called chromosomes. These chromosomes, it is believed, are responsible for the transmission of parental characteristics to the offspring according to the laws of heredity.

The purpose for which a cell is formed governs its type. With certain exceptions, all cells may be grouped into four main types—epithelial, connective, nervous, and muscular. The varieties of each type are numerous.



The epithelial cells constitute the protective tissues of the body, the lining or mucous membrane of the mouth, throat, stomach, and other similar organs, and the lining of the glands of secretion. The connective cells are thread-like in structure. As the name implies, they compose the material which ties up the various parts of the body, namely, the ligaments, cartilage, bone, fat, and fibrous tissue. The nerve cell is composed of a body with two slender arms—the dendron, which conveys messages to the cell; and the axon, which carries messages from the cell. The muscular cells are long fibrous structures, having the power to contract when stimulated.

**Physiology of the Cell.** Cells, like all living things, must have food, water, and oxygen; they excrete waste products, need rest, and, with certain exceptions, can reproduce their kind.

Instances of chemical change in the cells themselves are seen in the superficial layer of the epidermis (skin) when it becomes horny; in the mucous glands when they become filled with mucin; and in the adipose tissues when they become charged with fat.

**General Anatomy.** Derived from the union of two cells specially constituted for the role of reproduction (one male and one female), the complex mechanism, which finally becomes the human body, gradually takes shape. Masses of cells group themselves together to form specialized parts; these parts are called organs. Each organ, while performing its own special task, acts in harmony with certain other organs. The inter-action enables us to group certain organs into what are termed systems. The following are the main organic systems of the human body: the skeleton system (bones, cartilage), charged with the support of the body; the circulatory system (heart, arteries, veins), concerned with the circulation of the blood; the respiratory system, comprised of those organs (larynx, trachea, bronchi, lungs) responsible for respiration; the digestive system, which deals specifically with nutrition; the excretory system, which is engaged in the excretion of waste products; and the muscular system, which is responsible for movement. Presiding over all these is the nervous system (brain, spinal cord, and nerves).

That the teacher may know the reason for recommended health practices, it is necessary that he understand the functions of these various systems. For this purpose each of the principal systems of the body is discussed briefly from the point of view of anatomy, physiology, applied physiology, and pathology.

**Growth and Development.** Growth begins immediately after the fertilization of the female cell by the spermatozoan (male cell), and miracles are accomplished during the nine months spent by the embryo in the uterus. From conception the development of the embryo is influenced by various factors within and without. These factors are either hereditary or environmental.

The theory propounded by Bernard Mendel, the Austrian monk, in 1865, regarding the transference of characteristics in the breeding of peas has been shown to be, in the main, equally true of animals. In the young of any species certain inherited traits are dominant and certain are recessive, and the character of the individual is determined by the combination of these traits. In human beings inheritance is just as evident as in other living creatures. Colour of the skin, weight and height of the body, type of the bone formation, colour of the eyes and hair, shape of the eyes, ears, and nose—all these characteristics are inherited. Presumably certain mental characteristics are also inherited, as are certain pathological conditions, of which colour-blindness, webbed toes, and auxiliary fingers are examples. How are these characteristics transmitted? Within the chromosomes of the reproductive cells are found minute particles known as determinants or genes, and it is supposed that these particles are responsible for the transmission of inherited characteristics.

Neither acquired characteristics nor diseases of microbic origin can be handed on through heredity.

**Congenital Influences.** Those factors (trauma, infection, or malnutrition) which influence the growth of the child during his 280 days of intra-uterine life are said to be of congenital origin. Of congenital origin are modifications of body structure due to malposition of the foetus, to external or internal pressure, to injury, or to the action of organisms carried by the maternal blood supply. The lack of an adequate food supply for the mother may result in premature birth, in inanition in the child, or in such defects as faulty bone or tooth formation. Dysfunction (faulty functioning) of the glands of internal secretion is responsible for marked variations in both mental and physical growth.

**Environmental Factors.** Environmental factors which may influence the growth of the child after birth are diet, climate, season, illness, injury.

Since growth is influenced by so many variable factors, it is not possible to apply to any one child a fixed norm. What is normal growth for one child may not be normal for another, and the development of each child should be judged according to his individual standard.



## CHAPTER XVIII

### THE FRAMEWORK OF THE BODY

**Introduction.** The framework of the body is composed of numerous bones (200) bound together by elastic-like tissues known as ligaments. These bones vary in size and shape, from the long bone of the thigh and the flat bones of the face and skull to the irregularly shaped bones of the hands, feet, and spine.

**Formation of Bone.** In its original form bone is merely connective tissue. This tissue gradually changes to cartilage. At varying periods this cartilage is impregnated with bone-forming cells (osteoblasts). The time required for the transition from cartilage to bone varies from a few weeks to twenty years. Ossification of the collar bone (clavicle) for example, is well advanced shortly after birth, while the bones of the spine (vertebrae) require from eighteen to twenty years for complete ossification.

**Influence of the Spine on Posture.** At birth the spine of the child is slightly curved; this curve is lost when the child assumes a recumbent position. At the age of four months the spine begins to exhibit an inward curve in its upper third. This curve becomes more marked when the infant sits up. When the child begins to walk a similar curve appears in the lower third of the spine; and the central third at the same time becomes curved in the opposite, or outward, direction. Because of the wide variation in the flexibility of individuals, it is difficult to differentiate between good and bad posture in any particular child; but exaggeration of the spinal curves beyond normal limits may be regarded as poor posture.

**Pressure and Its Ill Effects.** The ability of the human body to adapt itself to its environment is remarkable. This adaptability is manifested in the fact that it is possible to change both the conformation and the shape of bone by constant pressure. The best known example of the reaction of bone to continuous pressure is the effect of binding on the feet of the female aristocracy of China. Bone changes resulting from pressure are regularly found in the feet of children who wear ill-fitting shoes.

**Pathological Changes Resulting in Bad Posture.** What are the skeletal factors which definitely influence posture? Certain pathological changes in the bone, due to the invasion of micro-organisms, as in tuberculosis of the spine; certain compensatory changes in the structure of one part of the body due to disease in other parts, as in infantile paralysis; certain structural changes

in the bone itself, as in rickets; certain deformities due to abnormal pressure during intra-uterine life—all these influence posture. Children affected in any of these ways are cripples, and the correction of their condition rests in the hands of the orthopedic surgeon. Approximately .2 per cent. of the school population of the province are in this class.

**Functional Bad Posture and Its Causes.** A large proportion of Ontario's school children tend to assume faulty postures. Is this condition due to skeletal changes? Not necessarily. In the main these children are suffering from fatigue, from ill-nourished muscles, or from lack of incentive to carry themselves well.

**Health and Posture.** Sound feeding, sunshine, and open-air exercise are essential to good posture; conversely, dietary deficiency, poor muscular development, and restriction in unnatural positions for protracted periods all result in postural defects.

That there is any connection between posture and health is difficult to establish. Children who are in poor health, of course, adopt a posture which, temporarily at least, lightens the muscular load. But that children in apparently good health may become ill as a result of poor posture is largely a matter of assumption.



## CHAPTER XIX

# THE MUSCULAR SYSTEM AND EXERCISE

**Introduction.** The muscular system has several important functions. Not only are the muscles responsible for our ability to work, play, and move about, but they also play an essential role in all less visible bodily functions, and aid in the protection of the vital organs, the major blood-vessels, and the nerves. There are two types of muscle—one known as voluntary, the other as involuntary. Muscles of the first type are those over which we have a measure of control, for example the muscles of the arm; the second group, over which we have no direct control, are those which are found in such organs as the stomach, intestines, and small arteries.

**The Anatomy of Muscle.** Under the microscope muscular tissue is seen to be made up of innumerable small thread-like fibres, about 1-500th of an inch in diameter and an inch in length, bound into bundles by connective tissue. The muscle fibres are actually elongated cells, cylindrical in form, surrounded by a sheath of elastic-like material. The muscle fibre thickens and shortens when it contracts and returns to its original shape when its task is performed. The blood supply for the muscles is found in the loose tissue which divides the bundles. The nerve endings pierce the wall of the cell and terminate in expansion known as nerve plates.

During foetal growth new fibres are formed from embryonic muscle cells (sarcoplasts). Further muscular development is brought about by the increase in size of the individual fibres.

Muscle is not only extensile (stretchable) but perfectly elastic, returning to its original form and shape after stretching.

**Tonus.** In the living animal muscles are more or less constantly in a state of slight contraction. This is a state of tonicity, or tonus, a readiness for immediate action. The degree of tonus is directly influenced by the nutritional state of the muscle and its nerves of supply, and by fatigue.

**Nutrition of Muscle.** The muscle fibres are nourished by those assimilable elements of food which are carried to them by the blood. The blood also supplies the muscles with the oxygen necessary to permit them to function satisfactorily, and removes waste products.

**Work.** Work is performed by the muscles as the result of a chemical change within the muscle fibre. This chemical action produces both energy and heat. The strength of the stimulus, the amount of work done, and the

number and extent of the contractions of the muscle fibre affect the relation between the percentage of energy and of heat produced. Violent contractions increase chemical change—less energy, more heat. Shorter contractions have the reverse action.

**Change in Muscle During Contraction.** The heat and energy produced by the muscles are the result of the combustion of oxygen and carbon. The oxygen comes from the haemoglobin of the blood, and the carbon from the animal sugar stored in the muscle. Following combustion, carbon dioxide is given off; sarco-lactic acid is produced; and the alkaline reaction of the muscle tends to become acid.

**Fatigue.** Fatigue is the result of the inability of the muscles to contract following over-work. This condition is caused partly by the exhaustion of the supply of combustible materials and partly by the excess of acid by-products. Waste products from exhausted muscles absorbed into the blood stream tend also to slow up the reactions of the central nervous system.

Fatigue has its beginning in the nerve end-plates, which apparently refuse to function in an acid medium.

**Physiology of Exercise.** When the muscles are exercised vigorously, certain contractile cells are asked to function either at a faster rate or over a longer period than usual. As a result the cells demand an increased supply of food. They burn up this food so fast that the waste products cannot be disposed of normally. This demand necessitates, therefore, increased activity on the part of the heart, the circulatory system, and the respiratory system, in order, first, to dispose of the greater-than-average quantity of carbon dioxide or waste products resulting from the muscular effort and, secondly, to supply the increased demand for oxygen. In extreme cases, following effort on the part of the circulatory system to meet a specific need, there occurs a depletion of the supply of blood to the brain with resultant loss of nerve functioning and loss of consciousness.

**Health Advantages of Exercise.** Why is exercise a desirable health practice? First, it aids in maintaining the elasticity of the muscle fibres, and it keeps them well nourished and capable of doing their ordinary tasks without fatigue. Secondly, regular exercise increases metabolism and aids in the consumption of excessive fats and glucose. Thirdly, by stimulating circulation it maintains the contractile power of the blood-vessels and ensures an adequate supply of blood for all the body organs. Warming the hands when they are cold by swinging them is an example of increasing circulation in the extremities by exercise. Exercise increases co-ordination (the working together of groups of muscles) and facilitation (the prompt response of muscle fibres to nerve stimulation). Regular moderate exercise is essential to the best health.



**Possible Disadvantages of Exercise.** Strenuous exercise necessitates sound heart muscle, elastic arteries, lungs which function perfectly, muscle fibres capable of continuous contraction and well supplied with food reserves, and sound kidneys. The absence of any of these conditions limits the capacity of the individual to take part in strenuous work or play.

**Conclusion.** Work, play, and exercise should be graded to meet the capacity of the individual child and of the muscles involved, and should not be carried to the point of fatigue. To prescribe the correct amount and kind of exercise for his pupils, the teacher must have accurate knowledge of their capabilities and limitations.

## CHAPTER XX

### NUTRITION AND DIGESTION

**Nutrition.** If the multitudinous cells which compose the various parts of the body are to be maintained in a maximum state of efficiency it is necessary that they receive an adequate supply of food, water, and air.

**Food Sources and Classification.** Food is needed to supply energy, to build and repair tissue, and to regulate body processes. The two sources of human food are plants and animals. Foods have been divided into groups according to their chemical composition and physiological action as follows:

Water	Carbohydrates
Inorganic Salts	Vitamins
Proteins	Regulatory Foods
Fats	

**Value of Certain Foodstuffs.** Each kind of food has a well defined rôle to play in the nourishment of the body.

*Water:* Water makes possible digestion, excretion, circulation, and the regulation of body temperature.

*Inorganic Salts:* Calcium, phosphorus, iron, and iodine are essential for bony growth, sound dentition, blood formation, and the functioning of the body generally. The body needs one gramme of calcium per day. This may be supplied by the inclusion of one quart of milk in the diet of children. Milk is the most fruitful source of calcium. No special consideration need be given to the body's phosphorus requirements, since sufficient phosphorus is supplied in any ordinary diet. Our knowledge of foods containing assimilable iron is distinctly limited. Until further knowledge is gained it may be necessary from time to time to add, under the doctor's direction, small quantities of inorganic iron to the ordinary diet. The same is true of iodine.

*Proteins:* Meat, fish, eggs, dairy products, and certain vegetables provide for growth and the restoration of tissue. Certain selected animal proteins (dairy products, meat, fish, eggs, and fowl) are known as Grade A proteins, and the protein needs of children should be largely drawn from these. The amount of protein consumed daily should be measured with some care. During childhood fifteen to twenty per cent. of the caloric requirements should consist of protein.

*Fats:* Though fats are classed as energy-producing foods, they have an additional responsibility; they are normally stored in the outer layers of the body, and so play a part in protecting the body from cold. The digestion of



fat is difficult for young children, and in their diet it should be limited in quantity, and confined to those forms which lend themselves to easy assimilation. The fat contained in milk is the most easily digested.

*Carbohydrates:* Starches and sugars are readily digested sources of energy. The physical activities of the person determine his carbohydrate requirements. In the diet of normally active children adequate provision should be made for the inclusion of cereals and cereal products, assimilable sugars, and other foods high in carbohydrate.

*Vitamins:* Vitamins play an important, if as yet ill-defined, rôle in stimulating growth and maintaining health. Our knowledge of vitamins is at the moment largely confined to an appreciation of their importance in the prevention of certain specific diseases, such as xerophthalmia, scurvy, rickets, and pellagra. The fact that they have an influence on growth and development is established, but the nature of this influence is not as yet accurately defined.

*Regulatory Foods:* Regulatory foods are those containing indigestible cellulose, which aids in the excretion of intestinal wastes.

**Preparation of Food.** Food should be carefully selected and properly prepared. It should be fresh, clean, and uncontaminated by harmful organisms. We should eat food cooked or raw, depending upon whether cooking adds to or subtracts from its digestibility and its nutritive value. It should be attractively served in reasonable quantities, and the surroundings in which it is eaten should be conducive to its enjoyment.

**Diet.** The diet necessary for a person is dependent on his age and weight and on the type of work he is required to do. The needs of the growing child are greater than those of the adult. A person engaged in a sedentary occupation needs less food than one employed in manual labour. Food requirements are often expressed in terms of calories, a calorie being the amount of heat required to raise one kilogramme of water one degree centigrade. The total calories needed for each day should be apportioned among the different types of food in the following ratio: protein, 15 per cent.; fat, 35 per cent.; carbohydrate, 50 per cent. Care should be taken to include in the diet foods containing the essential vitamins.

Each day's diet should contain the following:

Meat or fish—once daily.

Milk, 1-1½ pints.

Potatoes.

Eggs.

Two servings of fruit (one fresh).

Two vegetables (one leafy).

Butter.

Whole-grain bread or cereal.

Proper nutrition, though very important, is not the only factor in growth and development. Other things, such as exercise, rest, sunshine, effective elimination of wastes, and the absence of what is known as focal infection materially contribute to satisfactory development and health. Each of these points must receive serious consideration in the discussion of any nutritional programme.

### THE DIGESTIVE SYSTEM AND DIGESTION

The preparation of food for use by the body cells is called digestion and is the responsibility of that part of the body known as the alimentary or digestive system. Digestion involves: first, the mechanical breaking up of the food into small particles by mastication; secondly, the dissolving of these particles into a semi-liquid state by the action of the secretions of the mouth, stomach, and intestines; and, finally, the splitting up into complex molecules of these proteins, fats, and carbohydrates, until they are ready for assimilation by the body cells.

**Anatomy.** The organs comprising the alimentary canal are: the mouth, pharynx (throat), oesophagus (gullet), stomach, small intestine, and large intestine. Certain large glands (the salivary glands, the liver, and the pancreas) are essential parts of the system.

**Physiology.** Digestion begins in the mouth with the chewing of the food and the action of the ferment from the salivary glands, which converts cooked starch into a form of sugar. The food is then forced into the stomach by swallowing, where it is further acted upon by the movements of the stomach and the secretions of the cells in its lining membrane (hydrochloric acid, pepsin, and rennin). When the contents of the stomach have reached a certain stage of fluidity and acidity they are passed from the stomach into the small bowel. This action is largely brought about by slow rhythmic contractions of part of the stomach wall. After entering the small intestine the mass is further subjected to the digestive action of the secretions from the gall-bladder, pancreas, and the intestinal wall. These ferments all have a part to play in the splitting up of the complex molecular combinations into single molecules capable by osmosis and dialysis of passing through the walls of the intestine and of the blood-vessels, and then of entering the cell itself.

**Example of Digestion.** One example of how digestion takes place will serve. Carbohydrate is essential for the satisfactory production of energy. Carbohydrates are either starches or sugars, combinations of hydrogen and oxygen. Starch is largely found in cereals and vegetables. Each grain of starch is surrounded by a capsule of cellulose. This capsule is impervious to the action of digestive ferments and must be ruptured. Heat is the most effective method of splitting the capsule. Starchy foods, therefore, must be cooked. On entering the mouth, the cooked starch of flour, cereal, and



potatoes is prepared for digestion by mastication and mixing with saliva. Largely unaffected by its stay in the stomach, it is passed on into the small intestine, where the juices from the pancreas and the intestine itself change it into glucose. Passing through the thin lining membrane of the intestine, it is carried by the blood to the liver and muscles where it is stored as glycogen. When required, it is made available for the use of the functioning cell by the addition of two or more parts of hydrogen.

We have followed the digestible part of food to its destination. What of the waste? As the food passes through the intestine, those parts which do not lend themselves by absorption are propelled by the rhythmic movement of the intestine (peristalsis) through the twenty-eight feet of its length, to be ultimately excreted.

## CHAPTER XXI

# RESPIRATORY AND CIRCULATORY SYSTEMS AND FRESH AIR

Reference has been made to the necessity for oxygen in the process of metabolism. So fundamental is the need for an adequate supply of this essential element that its total absence brings about a cessation of bodily functioning in less than three minutes. The responsibility for the extraction of oxygen from the outside air and its distribution to the parts of the body which need it rests jointly upon the respiratory and the circulatory systems.

**Anatomy.** The respiratory system includes the nose, throat, windpipe, bronchial tubes, and lungs. The lungs are made up of millions of microscopic sacs (alveoli), each lined with a single layer of cells. Between the sacs run minute blood-vessels, the thinness of the walls of which permits free interchange of gases. Here the blood gives up its carbon dioxide and becomes recharged with oxygen.

**How Respiration Takes Place.** Fresh air contains normally about 21 per cent. of oxygen, 78.9 per cent. of nitrogen, and .03 per cent. of carbon dioxide. The nitrogen acts merely as a diluent of other gases and plays an insignificant rôle in the process of respiration. The inspiration and expiration of air is an automatic process occurring normally about twenty times per minute. Respiration is largely brought about by the movement of the diaphragm and the intercostal muscles, which, stimulated by the respiratory centre, contract and expand regularly. In expansion of the chest wall the intrapleural pressure is decreased, thus causing a corresponding expansion of the lungs. The increase in the available air space within the lungs causes an inrush of air from without.

**Exercise and Respiration.** If an excessive amount of work is performed by the body, the consumption of oxygen and the excretion of carbon dioxide increase. This increase necessitates a corresponding increase in respiratory effort. From the normal of twenty, the number of respirations rises to thirty, forty, or even fifty a minute, and the person gasps in his attempt to increase the air intake. When the unusual activity ceases respiration gradually returns to normal.

**The Physics of Respiration.** The principles which govern the flow of gases under pressure and the absorption of gases by liquids also govern the interchange of oxygen and carbon dioxide, first, within the lungs and, secondly, from the blood to the oxygen-hungry tissues.



When the venous blood enters the lungs it contains a greater quantity of carbon dioxide and a lesser quantity of oxygen than is found in the inspired air. The normal level of gases must be re-established, and after this has been accomplished, the arteries carry the blood, freed of its excess of carbon dioxide and with its oxygen content renewed, back to the tissues. Upon reaching the tissues, the blood finds a higher pressure of carbon dioxide and a diminished amount of oxygen, so an interchange again takes place, and the veins return the blood laden with carbon dioxide to the lungs. In both the lungs and the tissues the actual gaseous exchange takes place through the thin walls of the capillaries. The differences in pressure of the respective gases on either side of the capillary wall are responsible for the resulting exchange.

The process of normal interchange of gases in the body is simplified in an atmosphere of moderate temperature. In such air the moisture content is appreciably lower than that of the expired air and the oxygen content is higher.

This explanation of the process of respiration shows the necessity for an ample supply of fresh air which is in motion and is of the right temperature and humidity.

**Air Requirements for Health.** In order that an interchange of air may occur to the advantage of the body, it is necessary that the inspired air contain a maximum of oxygen, a minimum of carbon dioxide, no more than the requisite amount of moisture, and no noxious gases or minute solids. Furthermore, it must be close to body temperature; but nature takes care of the temperature of the incoming air by warming it as it passes through the nose. Out-of-door nature provides fresh air in unlimited quantities; but it is our responsibility to see that the air in buildings contains the essential ingredients in the proper proportions.

**The Rôle of the Blood in Respiration.** Only a small percentage of the oxygen carried by the blood is in solution in the plasma (the liquid part of the blood). The greater part of it is loosely combined with the haemoglobin of the red blood cells.

**Pathology.** Certain common diseases are intimately associated with the respiratory system. The common cold is an inflammation of the membrane of the nose and throat, caused by the activities of some invading micro-organism. The extension of these activities down to the bronchi (main divisions of the windpipe) causes bronchitis. Pneumonia is merely a further spread of the bacterial activities into the lung proper. Pleurisy is not an involvement of the lung but an inflammation of the two layers of the pleura (membrane), which envelop the lungs in a protective covering.

Tuberculosis of the lungs is caused by an invasion of the tuberculosis bacilli into the lungs, where, finding themselves in a favourable medium, they

proceed to break down the lung tissue. Tuberculosis is a disease of early adult life and is particularly insidious at its onset. It is characterized in the early stages by loss of weight, loss of appetite, fatigue, and often by a persistent or recurring cough. It is often well established before the patient appreciates the importance of his symptoms. Tuberculosis is largely spread by the exposure of a susceptible person to some one suffering from the disease in its active form

**The Circulatory System—Why the Blood Circulates.** Mention has been made of the blood as a carrier of oxygen to depleted tissues, of its activities in supplying the cells with food and water, and of its contribution to the well-being of the cells by the removal of waste products. These are three important functions, but there are others. The blood aids in maintaining the body temperature; it serves as the medium for the transference of the secretions of the ductless glands (hormones) to various parts of the body; and it further has a definite protective function, having the power to manufacture so-called anti-toxins, which counteract the poisons produced by certain harmful bacteria.

**The Blood.** The body of the average adult contains about ten pints of blood. Blood is a bright-red fluid of the consistency of milk. It is composed of a liquid part (plasma) and a cellular part made up of red and of white blood cells. On examination, following the separation of the plasma from the cells, we find certain dissolved proteins, inorganic salts, amino-acids, and glucose, all on their way to replenish the food supply of the cells. The blood also contains waste material excreted by the cells, which it is carrying to the kidneys.

**The Blood Cells.** The red blood cells owe their colour to a pigment known as haemoglobin. It is this pigment which enables the blood to carry oxygen. The oxygen forms an easily disrupted union with the iron of the haemoglobin. The combination is known as oxyhaemoglobin.

Each cubic millimetre of blood contains about five million red cells (a cubic millimetre is about one-twenty-fifth of a drop). The red blood cells are manufactured by the red marrow in the extremities of the long bones. These cells are unique in that they do not possess nuclei.

The white blood cells, which contain no haemoglobin, are larger but much less numerous than the red cells. A cubic millimetre of blood normally contains about 8,000 white cells. These cells have the power of movement and can apparently wander at will throughout the body. They act as protective agents, and in a sense as scavengers.

**How the Blood Circulates.** The circulatory system includes the heart, arteries, capillaries, and veins. The arteries are the vessels which carry the blood from the heart to the various parts of the body. Their walls are thick, strong, and elastic. The arteries vary in size. Some are almost an inch in



diameter, while others are so minute as to be invisible except through a microscope. Capillaries are the minute blood-vessels lying between the arterial endings and the veins. They are composed of a single layer of cells and permit the free interchange of liquids and gases. The veins collect the blood after it has passed through the capillaries. They, like the arteries, are of varying sizes, according to the tasks assigned them. They are equipped with valves to prevent stasis (stoppage). Their function is to return the blood to the heart.

The centre of this enormous network of canals is the heart. It is a muscular organ ingeniously divided into four chambers, the right and the left ventricle, and the right and the left auricle. The control of the heart is vested in the autonomic nervous system. Beating normally from seventy to eighty times a minute, it makes possible the circulation of both the arterial and the venous blood.

Returning from all parts of the body, the venous blood enters the right auricle. From here it passes into the right ventricle, and is expelled through the pulmonary artery into the lungs. After having its carbon dioxide replaced by oxygen it returns to the heart through the pulmonary veins, enters the left auricle, passes on into the left ventricle, and is thence driven through the miles of tubing to the tiny capillaries. Here it gives off the food and oxygen with which it is laden and, returning to the heart, completes its continuous cycle in less than a minute.

## CHAPTER XXII

# THE CENTRAL NERVOUS SYSTEM AND EMOTIONAL AND PHYSICAL HEALTH

The nervous system is a complex arrangement of specially designed cells, capable of transmitting and interpreting stimuli. It includes the brain, the spinal cord, and the nerves.

**Anatomy.** The brain is the most complex structure in the body. The lower portion, or bulb, is a continuation of the spinal cord; above this there is the small brain, or cerebellum; next comes the mid-brain, connecting the cerebellum with the cerebrum; and finally the cerebrum, or large brain itself. The brain proper is divided into lobes, and these lobes again into convolutions by fissures. It is about the size and shape of half a large muskmelon. It has the appearance of a curiously carved lump of dough.

**Physiology.** The cerebrum is the seat of the intellect. It contains those areas which control voluntary movement and is responsible for the interpretation of messages coming from the various sense organs. The centres responsible for speech, writing, and reading are situated in this part of the brain. The small brain is responsible for the control of equilibrium, muscular tension, and co-ordination. It supplements the action of the motor area of the cerebrum.

When an afferent (incoming) fibre enters the spinal cord it divides into three sets of branches. The first and shortest branch joins the motor cells in the anterior part of the spinal cord (the reflex centre). The second set passes to the cerebellum, and the third to the cerebral cortex (external layer of the large brain). Stimulation of the nerve ends results, therefore, in the transmission of messages through three different channels to all the brain centres which may have anything to contribute to the response.

To what extent are our actions reflex or volitional? Originally most of them are volitional and are the responsibility of the brain; but ultimately many of them become largely reflex in character. We walk at first with conscious effort, and then without thought. We concentrate our will power on an effort to learn to dance, to skate, or to swim, but ultimately we do these things automatically. When we have acquired the ability to perform acts without thought the large brain hands over the responsibility for controlling these actions to the subcortical centres and the spinal cord.

*Sensations:* Sensations are of several kinds: (1) those associated with general sensibility, such as pain, heat and cold; (2) subjective sensations, which



result in dreams and delusions; (3) those resulting from vibrations set up at a distance—light, sound, and radiated heat; and (4) those produced by actual contact—touch, taste, and smell. It is interesting to note that the eye interprets all stimuli as light. When struck in the eye we see sparks. The ear is sensitive to sound.

The time required to respond to a stimulus varies with the individual. The highly emotional person reacts more readily than the phlegmatic; the phlegmatic more readily than the dull; the dull more rapidly than the stupid; and so on, until in the idiot there is the minimum of response. The actual time required for a response varies between .00008 and .0015 seconds.

*The Spinal Cord:* The spinal cord, situated within the spinal column, and connected through the bulb with the brain, has two functions—(1) to carry messages from the muscles to the brain, and vice-versa; and (2) to assist in the control of reflex muscular action. The messages or impulses reach the cord through the various great nerves and their branches. These branches in turn are connected with all parts of the body.

*The Autonomic Nervous System:* Specialized groupings of certain nerves and ganglia constitute the autonomic nervous system. These nerves are in control of the functions of the body that are uninfluenced by the human will. The secretion of the glands, the processes of digestion, the action of the heart and of the respiratory system, are all controlled by this auxiliary nervous mechanism. This system is outside the central nervous system but is intimately connected with it. The autonomic nervous system comprises the sympathetic and the parasympathetic systems. The former is made up of thoracic and lumbar nerves, the latter of cranial and sacral nervous connections. These two systems exert an opposite effect on organs which they innervate.

*The Cranial Nerves:* The ramifications of the nervous system extend to every part of the body. The upper and the lower extremities of the trunk are connected with the central nervous system by branches of the spinal cord. The head and neck and the sense organs of the head are, however, connected directly with the brain through the twelve cranial nerves. Prominent among these are the optic nerve, the facial nerve, the auditory nerve, and the vagus nerve.

### Pathology.

*Mental Deficiency:* From our limited knowledge of how the nervous system works we can picture what happens if damage is done to any part of it. Injury to the large brain before, during, or soon after birth prevents normal intellectual development. The degree of sub-normality is in direct ratio to the extent of the injury. Sub-normal intellectual development is mental deficiency. Mental deficiency in varying degrees is found in about 2 per cent. of the school-age group.

*Loss of Certain Powers:* Damage to a certain part of the brain after intellectual development has been well established brings a diminution or a total loss of function in the part damaged, but not mental deficiency. Hemorrhage in the large part of the brain, for instance, may affect the speech or the writing centres without impairing the general intelligence.

*Mental Disease:* Insanity is an entirely different type of nervous disorder from mental deficiency. Insanity is due to a fundamental disturbance of the emotional, volitional, and reasoning faculties. It may be caused by disease or may be the result of a breaking down of these faculties under strain. Delirium associated with severe illness is a temporary form of insanity. In contrast to the mental defective, the psychotic (mentally diseased) child is usually brighter than the average academically. He is recessive (withdrawn into himself) and emotionally unstable. He breaks down usually in adolescence or in early adult life. Insanity (psychosis) is not common among children of school age.

*Neurosis:* Neurosis is an abnormal functioning of the nervous system without loss of intelligence. In this state a person is subject to impulses which he realizes are wrong but which he fails to control. Uncontrollable lying and stealing, and fears, phobias, and compulsions are examples of this condition.

*Tic:* Tic (or convulsive movements of certain groups of muscles as in St. Vitus' dance, and certain spasms of the head, shoulders, or other parts of the body) is an evidence of temporary or permanent injury to the controlling nerves.

*Abnormal Behaviour:* Abnormal behaviour, such as tantrums, hysterical outbursts, uncontrolled enthusiasms, or the retention of habits common during infancy (thumb-sucking, bed-wetting, masturbation, etc.) are usually evidences of neurotic tendencies. Many such manifestations are the results of faulty environment and may be eradicated by proper training. Children displaying such symptoms should receive, not punishment, but serious consideration from teacher, parent, and physician.

The teacher who encourages his pupils to be cheerful, useful, and sociable is making a very valuable contribution to their future life and happiness, both as individuals and as members of the community.

**Sleep, Rest, Relaxation, and the Central Nervous System.** Many theories have been advanced to explain sleep. What goes on in the human body during the period of sleep? Why do we need sleep? To what extent are there variations among individuals in their need for sleep? These are questions still awaiting satisfactory answers.

**Cause of Sleep.** Despite our limited knowledge of the subject it would seem that we may accept the theory that there is a relationship between fatigue



of the neuro-muscular system and the need for sleep. If, however, fatigue is carried beyond the point where relaxation is possible, sleep is prevented.

**Physical Changes During Sleep.** With sleep there occur certain changes in the body—for example, an appreciable drop in blood pressure, a retarding of the heart beat, and a slowing up of the glandular secretions, except the secretion of the sweat gland. Sleep is deepest during the first two hours after losing consciousness.

**The Hygiene of Sleep.** Good sleeping habits should be established early in life. Quietness and darkness, enough but not too much covering, cleanliness of bedding and body, a temperature kept moderate by the circulation of fresh air, and loose clothing—all these are conducive to restful sleep.

**Pathology.** The ill effects of loss of sleep are best evidenced in the reactions of the nervous system. Irritability, dullness of memory, inability to concentrate, slowness and confusion of perception are common results of loss of sleep.

**The Sleep Requirements of the Individual.** The need for sleep differs with the age of the individual, his intellectual interests, and his emotional make-up. From the new-born infant, who sleeps most of the time, to the adult who needs only from seven to eight hours in the twenty-four, different people require various amounts of sleep. The following periods are suggested: for the small child of from 2 to 4 years—14 hours, including a nap in the daytime; for the 5 to 8-year-old—12 hours; for the child of from 9 to 16 years—9 to 11½ hours. Highly intellectual people who are keenly interested in their work need less sleep than others.

**Somnambulism or Sleep-Walking.** Somnambulism, or sleep-walking, is usually found among people who are emotionally unstable. This tendency is due to the temporary dominations of the subconscious mind.

**Insomnia.** The commoner causes of insomnia (sleeplessness) are: drugs, tea, coffee, tobacco, alcohol, indigestion, anaemia, pain, excitement, or extreme intellectual effort.

## CHAPTER XXIII

### THE SKIN AND CLEANLINESS

The skin is the outer covering of the body. Normally pink in colour (though the colour varies with the complexion of the individual), warm to the touch, and elastic when stretched, it serves more useful purposes than would at first glance appear. Besides having a protective function it is a valuable aid in the excretion of wastes; it supplies the hair and nails with nourishment; and it contributes to the control of the body temperature.

**Anatomy of the Skin.** The skin is from one-fiftieth to one-sixth of an inch in thickness. It is thinnest over the eye-balls, and thickest on the soles of the feet. It is composed of three layers, the outermost of which is known as the epidermis or cuticle. The epidermis is made up of numerous layers of cells; the outer layers are hard and horny. This part of the skin has no blood-vessels, but has nerve fibrils in the deeper layers.

Beneath the cuticle is the dermis, or true skin, which is largely composed of dense fibrous tissue and freely supplied with blood-vessels. In the dermis is found the pigment which determines the complexion of the individual.

The subcutaneous fatty layer is really a sub-division of the dermis, differing from it in the length of the connective tissue fibres and the presence of fat. In the skin of the scalp and of the palms of the hands the amount of fat is limited.

**The Hair and Nails.** The hairs are contained in pits or follicles; that part which is within the follicle is known as the root. The main part of the hair is composed of pigmented fibrous material. A small bundle of plain muscle fibre is attached to each follicle. When these muscles are contracted under the influence of fear or cold, the hair is erected and the skin roughened (gooseflesh).

The sebaceous glands are small ducts opening into the upper portion of the hair follicles. They secrete a fatty fluid which acts as a lubricant to the hair. The excess oil passes on to the skin and keeps it from becoming excessively dry (chapped) or water-logged.

The nails are thickenings of the horny layer of the skin, designed chiefly for offence.

**The Sweat Glands.** The sweat glands, 2,000,000 in number, are abundant over the entire body, but are most numerous in the palms of the hands and the soles of the feet. Perceptible sweating is largely caused by high



temperature or by emotion. On an average, a person loses two pounds of sweat in twenty-four hours.

**Physiology.** We have said that the skin has a protective function. This is partly due to the fact that it contains the sense of touch. It also prevents the entry of harmful bacteria into the body and is resistant to sharp objects and harmful chemicals. It aids in the regulation of the body heat in two ways—first, by radiation and, secondly, by evaporation of sweat. The ability of the skin to regulate body heat is, of course, affected by external temperature and by clothing. Sensation is an important function of the skin. The efferent cutaneous nerves are sensitive to at least five different types of stimuli—pain, heat, cold, touch, and pressure. The nerve endings responsive to these types of stimuli are present in the entire skin, but those sensitive to pain are the most superficial, those sensitive to warmth the most deeply seated.

**Pathology.** Dryness of the skin indicates inadequate functioning of the sweat glands; unusual greasiness or clamminess shows an excessive activity of these glands. The presence of blackheads or pimples is evidence of infection of the sweat glands or of the hair follicles. Certain skin diseases common among children of school age are of hereditary origin; for example, the excessively dry, scale-like skin of ichthyosis. Most skin diseases, however, are the result of infection. Scabies, or itch, the commonest of these diseases, is caused by a small parasite, the itch-mite, which burrows into the softer parts of the skin (between the fingers, and at the wrist and elbow joints) and sets up an irritation resulting in severe itching. Scratching results, and often inflammation (secondary infection or dermatitis) follows. Scabies is highly communicable, and persistent treatment is necessary to eradicate it.

Impetigo contagiosa is, as its name implies, highly communicable. Commencing as a cluster of small blisters, it rapidly forms a scab which has a stuck-on appearance. It is usually found around the mouth and nose. Impetigo readily responds to proper treatment.

Ringworm is found on the scalp, face, body, and feet. This condition is due to a fungus-like growth which invades the skin and denudes the invaded surface of hair. It is very difficult to treat when on the scalp or on the feet, but is readily treated when found on the face or on the body.

Such skin diseases as hives (urticaria) and eczema may result from a variety of causes. They are usually constitutional in origin. The skin is also susceptible to certain irritants such as the juice of poison-ivy.

**Cleanliness.** The idea that dirt and disease are related is more or less firmly fixed in the minds of many people. It is commonly believed that the child who is dirty, or who is placed in a dirty environment, is more susceptible to illness than the child who is clean and who lives in clean surroundings. This belief was probably established when such diseases as bubonic plague,

typhus, cholera, and yellow fever were more prevalent than they are in civilized countries to-day. The fact is, however, that the majority of the so-called preventable diseases are due to micro-organisms and not to dirt. The greater severity of epidemics among people of the lower social orders is due, not to lack of cleanliness, but to the intimacy of their living conditions. Overcrowding is a greater menace than dirt in the spread of disease. In the past we have probably over-emphasized the effect of cleanliness on health. Let us, however, continue to urge its desirability for the sake of comfort and beauty.

Though dirt is not a direct cause of disease, uncleanly habits may play a part in spreading certain diseases. Putting into the mouth things other than food—for example, pens or pencils—may lead to an attack of disease, provided the organism responsible has been recently transferred to the pen or pencil by a person suffering from the disease. This habit should, therefore, be condemned, as should the practice of using a common drinking-cup or a common towel. Lack of cleanliness implies carelessness and carelessness is a vital factor in the dissemination of contagion.

While cleanliness of the skin may be largely a matter of attractiveness, it has a certain bearing on health, because washing aids in the elimination of waste products by keeping the pores open and by carrying away germs which may cause disease.



## CHAPTER XXIV

### THE TEETH

The teeth are an integral part of the bony skeleton, and their failure to develop properly or to retain their usefulness is just as likely to be reflected unfavourably in the vital functioning of the body as if any other part were affected.

**Number and Names.** Man, in common with most animals, is provided with two sets of teeth. The first, or deciduous set, twenty in number, has a limited term of existence. In both the upper and the lower jaw, on either side of the middle line, there are in the set two incisors, one canine, and two molars. In the secondary set the number is increased to sixteen in each jaw. The two bicuspid replace the temporary molars, and three permanent molars are added on both sides, in both the upper and the lower jaw.

**Anatomy.** The visible part of the tooth is known as the crown; the part which holds it in place, is the root. The tooth proper is made of five distinct parts: enamel, dentine, pulp, cementum, and pericementum. The enamel is the hard outer covering, and the dentine forms the bulk of the tooth, making up the greater part of both the crown and the root. Normally the dentine is never exposed to the surface. The pulp is composed of a mass of loosely woven connective tissues, supporting the blood-vessels and the nerves. The cementum protects the dentine of the root. The pericementum is composed of tough, fibrous tissue, the duty of which is to hold the tooth in its socket.

**The Formation of the Teeth.** The temporary (deciduous) teeth begin to form about the seventh foetal week and continue to grow until the child is three years of age. Calcification of the temporary teeth is complete at birth. The secondary teeth begin to form about the seventeenth week of foetal life. The calcification of the crown commences about one month after birth, and the calcification of the whole set is usually complete at about eighteen to twenty years of age.

**Diet and Teeth.** Though certain dental characteristics are the result of heredity, the quality of the teeth seems to be primarily a matter of the supply and assimilation of tooth-building material in the diet of the mother and later of the child. Calcium and phosphorus in proper proportions and in assimilable form must be made available if sound teeth are to result. Satisfactory assimilation of these mineral salts is made possible by the presence of vitamins A, D, and C, each of which has a part to play in the production of sound teeth.

**The Function of the Teeth.** The function of the teeth is to bite off and break up certain types of food. The first of these functions is not as important as it formerly was in view of our present method of eating; but it is still significant, particularly in the eating of fresh fruits. Children with carious teeth and involved gums are usually not attracted by such fruits as apples and pears. Proper mastication of food is an essential part of the digestive process: first, because chewing crushes the food into the smallest particles, thereby rendering it capable of dissolution by the digestive juices in the stomach; secondly, because during the process of chewing, the starch-converting ferments of the saliva are given an opportunity to act upon the food.

**Pathology.** Acute illness during the period of tooth formation has an injurious effect on the quality of the teeth. Pits and fissures which lend themselves to decay sometimes result from ill health.

Dental decay (caries) is the commonest tooth defect among children. Probably 95 per cent. of all children exhibit this condition at some time or other. Most of the theories previously advanced to explain its prevalence have been based on the almost universal presence of certain forms of bacteria in the mouth, the increased activity of which was presumed to result from a diet high in carbohydrates. From more recent research, however, one would deduce that, while a clean mouth is undoubtedly desirable, there is need for increased emphasis on the dietary factor and less on the bacterial if progress is to be made in controlling dental decay.

**Dental Hygiene.** Malposition and malocclusion (faulty closing) are subject to correction, and children suffering from these conditions should receive appropriate treatment. Fissures should be treated immediately upon their discovery, and early discovery can result only from regular examination by a dentist. Such examinations should begin in the pre-school period.

The preservation of the deciduous set of teeth is as essential as that of the permanent set. No child should be denied treatment because the affected teeth belong to the first set. Special attention should always be directed to the retention of the first permanent molars, which appear at about six years of age. These teeth are too often confused with the temporary set. The untimely loss of these "keystone teeth" often results in faulty occlusion and decay.

Cleansing the teeth has two purposes: one, the beautifying of the teeth; the other, the removal of film and the accumulation of food debris from between the teeth and about the margin of the gums. If properly carried out, cleaning also stimulates circulation in the gums.



## CHAPTER XXV

### THE EYE AND VISION

Normal vision involves the adequate functioning of the visual apparatus in the perception of light, colour, form, and depth. To understand these functions of sight, we must have a knowledge of the anatomy of the eye, and must realize the close connection between the eye and the brain.

**Anatomy.** The eye-ball is globular in shape and is situated in a cavity of the skull, which is designed to give protection and to ensure a wide range of sight. The ball is moved by the action of certain muscles; it is supplied with blood-vessels and nerves; and it is protected by such appendages as the eyelids and eyebrows. The wall of the eye is composed of three layers. The outer layer, known as the sclera, or sclerotic coat, is made up of tough fibrous tissue, and is chiefly protective in its function. In the front it is clear and transparent, and is known as the white of the eye or cornea. The sclerotic coat is pierced at the back by the optic nerve and into it are inserted the muscles which move the eye-ball. On its inner surface it is grooved for the passage of the blood-vessels supplying the eye.

The second layer, known as the choroid coat, contains the blood-vessels of the eye, and covers the posterior five-sixths of the eye-ball. The ciliary body is an extension of the choroid coat connecting it with the iris. The iris is like a curtain which regulates the admission of light through a central opening, the pupil.

The inner coat, or retina, is a delicate membrane composed of numerous layers of highly sensitive nervous tissue. One of these is worthy of special mention, namely, that known as "Jacob's Membrane." It is made up of highly specialized cells, known as rods and cones. The corner of the retina is a faint purple, because of the presence of colouring material known as visual purple. In the centre of the posterior part of the retina, corresponding to the axis of the eye, is an oval part called the yellow spot (*macula lutea*). At this point vision is most perfect. It is upon the retina that the images of external objects are registered.

The refracting media of the eye are four in number: (1) the cornea; (2) the aqueous humour, a water-like liquid which fills that part of the eye-ball known as the anterior chamber; this is bounded in front by the cornea and behind by the iris; (3) the vitreous humour, forming about four-fifths of the entire globe and filling the concavity of the retina; this part is hollowed in front for the reception of the crystalline lens; it is transparent and is of the consistency of thin jelly; (4) the crystalline lens, a transparent,

bi-convex body, consisting of layers of parallel fibres, which are actually minute prisms fitted accurately into each other. The lens is situated immediately behind the pupil in front of the vitreous humour and is encircled by the slightly overlapping ciliary body. It is enclosed in its capsule, a transparent, highly elastic membrane.

**Physiology of the Eye.** This brief description of the anatomy of the eye permits an equally brief discussion of the physiology of vision. We have said that the eye functions in terms of light, colour, form, and depth. We shall deal with each of these functions in turn.

*Light Perception:* The ability of the eye to perceive light is dependent on the presence of the visual purple in the retina, and on the existence of the minute rods in the "Jacob's Membrane." The unsatisfactory development of this ability is known as night blindness, and may occur in persons living on a diet deficient in Vitamin A.

*Colour Perception:* Colour perception is the responsibility of the cones found in the "Jacob's Membrane." It is presumed that there are three kinds of cones attuned to the three primary colours—red, green, and blue. The proper combination of these three types of cones makes it possible for the eye to perceive one hundred and eighty distinct colours. Colour sense is probably well developed by the end of the second year. Any affection of the cones leads to colour blindness, a condition which is present to some degree in about 8 per cent. of white males, and about 4 per cent. of white females. It is a hereditary defect, transmitted through the female members of the affected family.

*Form Perception:* The recognition of the form of objects is made possible by the functioning of the cones previously referred to, particularly of those situated about the yellow spot. This ability to recognize form is termed visual acuity. It is affected favourably by the amount of light playing on the object seen and it may be adversely affected by imperfections of the lens and irregularities of the curve of the cornea.

*Depth Sense:* Unlike the senses of light, of colour, and of form, the so-called depth sense requires the co-ordinated use of both eyes. Each eye gives a separate image of the same object from a different angle, and these two images are combined in the brain into a picture containing length, breadth, and thickness. The ability of the brain to correlate two such images is called the fusion faculty. This faculty is not present at birth but develops as the ocular apparatus gradually reaches perfection.

The ability to recognize accurately light, colour, form, and depth implies a perfectly normal eye.

*Physics of Vision:* Light is composed of waves of varying lengths. Visible rays are intermediate in length between the ultra-violet or X-rays and the infra-red or radio waves.



Waves of light travel in parallel lines. When they strike an object they are either reflected or absorbed, the degree of absorption being dependent on the colour of the object met with. Black absorbs much greater quantities of light than white. The action of the retina is stimulated by those rays which have been reflected from the visible object. The length of the waves gives the object its colour. If the red rays are reflected and the green and blue absorbed, the object is visibly red. If the green rays are reflected and the others absorbed, the object is green. If all the rays are equally reflected and none absorbed, the object is white; if all are absorbed it is black.

Refraction of light, or the bending of the light rays, is necessary in order that the rays may be focused on the retina. Water and glass share this refractive power with the crystalline lens of the eye. A convex lens refracts light by converging the rays on one point. A concave lens diverges them. The refractive power of a lens is produced by its degree of convexity or concavity; the greater the convexity, the shorter the distance between the lens and the point of focus. We have said that light waves are parallel. This is true of those coming from a distance, but reflected rays from near objects radiate at an angle. A convex lens has the power to gather in these divergent rays and bring them to a focus in much the same fashion as it focuses parallel rays.

### Pathology.

*Myopia and Hypermetropia:* When the distance between the lens and the retina is normal, the lens without effort brings both divergent and parallel rays to a satisfactory focus on the retina; this normal state is known as emmetropia. When, however, the distance between the lens and the retina is greater than normal, the rays are brought to a focus in front of the retina; this condition is called myopia, or short-sightedness. Hypermetropia, or long-sightedness, the opposite condition, exists when the rays are not focused on the retina but would, if extension were possible, come to focus behind it. A measure of hypermetropia is common at birth. Even if it continues to exist to a pathological degree, it may be unrecognized as a vision defect for years because of what is known as accommodation. Accommodation is the ability of the eye to focus both diverging light rays coming from a near object and parallel rays. The most widely accepted theory of the mechanism of accommodation is that offered by Helmholtz. Normally the lens is held elongated by the suspensory ligaments. Contraction of the ciliary muscles releases the tension on these ligaments, which permits the lens to adopt a more convex form, due to its own elasticity. The myope, however, gets no help from accommodation; the lens has no power to change its shape in a way that will aid him; his difficulty can be overcome only by artificial means.

*Astigmatism:* One other condition is commonly found among older children. Sometimes the normal curvature of the cornea is absent. This condition is known as astigmatism, and when extreme it results in double vision.

*Injury or Infection:* The eye may be affected by certain organisms, or may be injured by small particles of dirt or other irritating substances. Inflammation of the lining (conjunctivitis), if due to bacteria, is usually communicable and may, if neglected, do serious damage to the eye itself. Affection of the hair follicles of the eyelashes (blepharitis), while perhaps not serious in itself, is an evidence of poor health and lack of care and if untreated may result in the permanent loss of the lashes. The removal of extraneous material from the eye is a task not lightly to be undertaken, and if the particle does not come away readily the services of a physician should be sought. Much permanent damage is done to the eye by the entry of sharp objects and by injuries received from the premature explosion of fireworks, caps, etc. Due emphasis should be placed upon avoiding the possibility of such damage.

*The Normal Eye:* The normal eye presents certain characteristics. It is properly placed in its socket—that is, it does not protrude. It shows no sign of inflammation or congestion of the lining of the lids (conjunctiva). The lids themselves when everted will be free of inflammation and will show no sign of dried exudate around the eye-lashes. A normal eye gives no evidence of scarring on the pupil or iris. It will react to light or dark by a contraction or a dilation of the pupil. There will be no uncontrollable movements of the eye-ball or of the lids. The eyes themselves will focus in an approximately straight line without sign of so-called crossing. The child with normal eyes will not squint nor peer in an effort to see distant objects nor will he bring small objects closer to his eye than twelve to fifteen inches in order to interpret their form.

**The Hygiene of the Eye.** In seeking to prevent defects in vision one must keep in mind the possible relationship between acute and chronic illness and the loss of visual effectiveness. Due consideration should also be given to the harmful effects of unsatisfactory diet. Care of the vision of children during convalescence after illness is very important; and at all times children should be taught the importance of conserving vision by the avoidance of eye strain. The teacher must recognize the difficulties under which the child with defective vision labours in his efforts to maintain his grade level and should be willing to make the necessary adjustments in the teaching programme to meet his particular needs. The teacher can also do much to ensure that the child receives the necessary medical advice and supervision.



## CHAPTER XXVI

### THE EAR AND HEARING

Interpretation of sound is a responsibility shared by the brain and the ear. The congenital absence of, or subsequent damage to, any part of the mechanism of the ear, or any defect in that area of the brain associated with hearing may lead to loss of hearing, either partial or complete. If such loss occurs before the third year it is accompanied by the loss of the power to speak. Consequently, children born deaf are invariably mutes.

**Sound.** Sound is the result of vibrations set in motion at various rates; loudness, timbre, and pitch are due to variations in the speed, the height, and the shape of the waves. Sound travels at the rate of 1,100 feet per second. In comparison with light, sound travels so slowly that the voice of the radio announcer at a ball game is heard by the radio listeners before it is heard by those actually present in the ball park. Sound vibrations which occur at rates slower than 20 and faster than 30,000 per second are not heard by the human ear. The slower the vibration, the deeper the sound. The ordinary range of the human voice is between 90 and 900 vibrations per second.

**Anatomy.** The ear is divided into three parts: (1) The external ear—consisting of the visible part, specifically designed to catch sound waves and a tube (auditory canal) about an inch long, which conducts the sounds to the drum (tympanum). (2) The middle ear—a chamber closed to the outside by the drum but open on the inner side to the back of the throat (naso-pharynx) through the Eustachian tube. This part of the ear contains three small ingeniously formed bones, the first of which is fastened to the drum. This conducting apparatus carries the sound waves to the internal ear. (3) Internal ear (labyrinth)—within which are the terminal parts of the auditory nerve. This part of the ear transposes sound waves into impulses capable of ultimate interpretation by the brain cells.

The shape of the inner ear (labyrinth) is as complicated as its name implies. Through the semi-circular canals and the vestibule into the cochlea the membranous labyrinth closely follows the bony structure; it ultimately terminates in the 10,000 rods of the organ of Corti, with which are intimately associated the endings of the auditory nerve. The semi-circular canals of the inner ear aid also in the maintenance of equilibrium. Disease of these parts causes giddiness. When they are destroyed the power to maintain an upright position is largely lost. Sea-sickness and the giddiness which results from swinging are due to excessive stimulation of these canals.

Special reference must be made to the Eustachian tube. This tube is a combination of bone, cartilage, and fibrous tissue and is about an inch and a

half in length. It runs from the middle ear downward, forward, and inward to the back of the throat. The lining of the Eustachian tube is frequently attacked by inflammation which has extended upward from the throat and nasal passages. The chief function of the Eustachian tube is to permit the free passage of air into the middle ear so that the pressure on both sides of the tympanic membrane may be equal. Otherwise the membrane would be ruptured by pronounced differences in pressure.

**Physiology of Hearing.** Sound waves are caught by the visible part of the ear, are carried downwards by the auditory canal, and impinge on the drum or tympanum. The sound vibrations are transmitted to the membrane and are conducted by the three bones of the middle ear to the so-called oval window of the inner ear. They are then passed on through the fluid in the cochlea to the organ of Corti; whose hair cells beat in unison with the original vibrations, giving the appropriate impulse to the fine nerve endings situated in each hair cell. These impulses are then carried to the temporal lobe of the brain by the auditory nerve, where they are interpreted.

**Pathology.** Damage to any part of the chain necessarily interferes with sound transmission. Plugging of the auditory canal with wax, rupture of the drum, inflammation of the middle or inner ear, or injury to the auditory nerve or to the brain itself, may result in partial or in total deafness. By inflammation of the Eustachian tube, or of the adenoid tissue adjacent to it, the middle ear is deprived of the air which is necessary for the satisfactory transmission of sounds. This condition leads to the difficulty of hearing which is a common accompaniment of a cold in the head. Furthermore, it is possible for the inflammation actually to spread into the ear, causing middle-ear disease (otitis media) with its resultant rupture of the drum and discharge. This discharge at first is largely serous in character, but if the proper treatment is not applied it may become thick, creamy, and offensive and may persist indefinitely, with ultimate loss of hearing.

**The Prevalence of Defective Hearing.** The number of children suffering from defective hearing is about 4 per cent. Most of these are suffering from loss of hearing in one ear only and their condition is all too often unrecognized.

Though modern civilization demands the highest physical efficiency, a measure of sub-normal hearing is compatible with success; in fact, many people have a very definite hearing defect without being themselves aware of it. This is no justification, however, for ignoring the fact that moderate deafness is both a social and an economic handicap. Unfortunately, unless the condition is recognized before adolescence, little can be done to cure it. If a reasonable degree of success is to follow treatment early recognition of all cases of potential deafness is imperative.



## CHAPTER XXVII

### THE NOSE AND THE SENSE OF SMELL

**The Function of the Nose.** The rôle of the nose in the process of respiration is largely confined to admitting air in adequate quantities for normal requirements, raising the temperature of the inspired air, and removing from it dust and other minute solids. The nose also acts as the logical exit for air expired from the lungs. The warming and cleaning of the air is made possible by its enforced passage over the moist folds of mucous membrane in the nose, which are well supplied with blood at body temperature. Fine hairs situated within the nose aid in extracting dust and dirt from the incoming air. Associated with the nose is the sense of smell, by which we detect the odour of any object, the make-up of which permits it to give off minute odoriferous particles.

**Sense of Smell.** The olfactory region in man is confined to the upper part of the nose. The size of the area in which the highly-specialized olfactory cells are situated materially affects the sense of smell of the individual. The appropriate stimulation of these cells is communicated to the olfactory tract of the cerebrum through the olfactory nerve. Such stimulation occurs only when the odorous substance is in a gaseous state.

The delicacy of the sense of smell is so remarkable that 3-100,000,000ths of a grain of musk can be readily detected.

Some persons have a highly developed sense of smell but others can detect certain smells only. Some are unable to detect any odour, even such pronounced ones as those of mignonette, vanilla, violet, and benzoin.

When two odorous objects are smelled together the odour of one counteracts the odour of the other. Again the odour of certain objects seems to change during the process of smelling. For example, liquid nitro-benzol when first smelled gives off the odour of heliotrope, then the odour changes to that of bitter almonds, and finally to that associated with benzine.

The ability to detect odours is affected by the amount of secretion in the nose, by fatigue of the nerve endings, by damage to the membrane which lines the nose, by injury to the olfactory nerve or tract.

**Pathology.** Injury to the cartilaginous part of the nose (the dividing septum) is a common cause of partial or complete occlusion (blockage) of one side. Overgrowth of the adenoid tissue at the back of the nose prevents the ready ingress of air and a person who suffers from such overgrowth is forced to breathe through his mouth. This manner of breathing not only disturbs the normal process but causes the nasal mucosa to become moist and susceptible to infection, a condition which results in a more or less chronic

discharge. Mouth breathing when neglected leads to pronounced changes in the facial structure of young children.

Snoring is due to failure of the nasal passages to maintain normal integrity when the mouth is open and is common among those suffering from some occlusion of the nose.

Defective nasal breathing may be suspected when a child is a chronic mouth breather or shows a tendency, especially in colder weather, to nasal colds with persistent discharge and mouth breathing.

## SPEECH

Speech is the result of impulses originating in the cerebrum, and transmitted to the organs used in speaking. The fundamental tones of the voice are produced by the current of expired air causing vibrations of the vocal cords.

**Anatomy.** The vocal cords are two thin-edged bands of elastic tissue contained in a cartilaginous box (larynx) situated at the top of the windpipe (trachea). They are attached behind to that portion of the larynx which is called the arytenoid cartilage and in front to the thyroid cartilage (Adam's apple). Their movements are controlled by muscles. The diaphragm and the muscles of the chest control the breath required for speech.

**Physiology.** When at rest the vocal cords lie close to the side walls of the larynx and the inspired or expired air does not come in contact with them. When any vocal effort is made, however, the opening between the cords is narrowed; they are brought into a parallel position; and their tension is much increased. The greater the tension, the higher is the note produced. The range of the voice depends principally on the extent to which the tension can be altered. A woman's vocal cords are shorter than those of a man and for this reason a woman's voice tends to have higher pitch.

The loudness of the voice is influenced by the amplitude (height) of the vibrations, while the pitch is dependent on their frequency. The timbre of the voice is that quality which distinguishes one voice from another. Timbre is due to the mixture of the primary vibrations with the secondary vibrations or overtones.

Vocal sounds are usually produced by the expired blast of air; it is possible, however, by practice to employ the inspired current. This ability is used by the ventriloquist. Singers take advantage of the possibility of changing the volume and quality of the voice by increasing the volume of expired air and modifying the action of the resonating chambers, namely, the pharynx, the mouth, and the nasal cavities.

Intelligible speech is made possible by the modification of the fundamental notes emitted by the larynx. By changing the size and shape of the



pharynx, mouth, and nose certain overtones are picked out and exaggerated; this accentuation of certain overtones gives us the vowel sounds. The consonants are produced by interruptions of the outflowing air caused by the soft palate, the tongue, the teeth, and the lips.

**Pathology.** There are a number of factors which may affect the power of speech. The ability to speak is absent in cases of congenital deafness and in some cases of idiocy or of injury to the cerebral cortex. It is temporarily lost in certain types of hysteria. Children who become deaf before they are three years of age usually lose their ability to talk and become dumb. The ability to speak is delayed in certain cases because of injury at birth to the cortex of the left hemisphere of the brain. In such cases the right side ultimately takes on the task usually performed by the left. In aphasia, a condition commonly associated with cerebral hemorrhage, or apoplexy, the ability and the will to speak are both present but the connection between the two is disrupted.

Certain children suffer from special speech defects—for example, lisping and stammering. Lispings is due to tongue-tie, cleft palate, hare-lip, or malocclusion of the teeth. Stammering or stuttering, found more commonly among boys than girls, is the result of a spasm of the muscles associated with speech and is evidence of an emotional disturbance. About 3 per cent. of all children who enter school suffer from some speech defect. More than 50 per cent. of these are handicapped merely as the result of bad environment or faulty training; without effort on the part of the teacher, the condition corrects itself within six to twelve months. Children who lisp will profit materially by the teacher's help. The child who stammers, however, is suffering from a condition, the correction of which requires not only the sympathy of the teacher and parent, but also careful training under the direction of a person who is specially qualified for this type of work.

#### References for the Teacher:

- Aykroyd, W. R.: *Human Nutrition and Diet*. Butterworth, 1937. (Nelson, Toronto.)  
 Best and Taylor: *The Human Body and Its Functions*. Gage, Toronto, 1932.  
 Bogert and Porter: *Dietetics Simplified*. Macmillan, 1937.  
 Cockefair and Cockefair: *Health and Achievement*. Ginn, Montreal, 1936.  
 Eastwood, C. G.: *Hygiene for Students and Teachers*. Edward Arnold, 1936. (Macmillan, Toronto.)  
 Furneaux, Wm. S.: *Human Physiology*. rev. by William A. M. Smart. Longmans, Toronto, 1935.  
 Hill, Sir Leonard: *Manual of Human Physiology*. Edward Arnold. (Longmans, Toronto.)  
 Meredith, F. L.: *Hygiene*. Blakiston, 1932.  
 Rose, Mary Swartz: *Feeding the Family*. Macmillan, 1935.  
 Sherman, Henry C.: *Food and Health*. Macmillan, Toronto, 1934.  
 Smiley and Gould: *College Textbook of Hygiene and Community Hygiene*. Macmillan, Toronto, 1935.  
 Wheat and Fitzpatrick: *Everyday Problems in Health*. American Book Co., (Gage, Toronto.)  
 Wheat and Fitzpatrick: *General Biology*. American Book Co., 1932. (Gage, Toronto.)  
 Williams, J. F.: *Healthful Living*. Macmillan, Toronto, 1934.  
 Winslow and Williamson: *The Laws of Health and How to Teach Them*. Merrill, 1926. (Clarke, Irwin, Toronto.)

## PART IV

# COMMUNICABLE DISEASES

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### CHAPTER XXVIII

## CAUSES, PREVENTION, AND CONTROL OF COMMUNICABLE DISEASES

**Causes of Communicable Diseases.** Diseases divide themselves roughly into three groups, namely, those that are communicable, those that are preventable, and those that are as yet unaffected by measures aimed at their control. We are at the moment chiefly concerned with the first mentioned group. A communicable disease may be defined as one of bacterial origin which is spread by direct or by indirect contact. The list of communicable diseases comprises all of the commoner diseases of childhood, and many more that are not generally found in this country, such as cholera, plague, yellow fever, and malaria.

Certain diseases have been recognized as communicable for many centuries, although it is only since the general acceptance of the germ theory that the full extent of the communicability of disease has been realized.

According to the germ theory, many diseases are caused by living organisms called bacteria. These organisms are so small that high-power magnification is necessary to detect them. They enter the body usually through the mouth or nose and, finding there a suitable home, they grow and multiply until they become a menace to the health of the person attacked. Harmful effects may result from the presence of bacteria in three ways: first, by the destruction of the tissue attacked; secondly, by the action of the poisons given off by the organism; and thirdly, by the toxic influence of the poisonous end-products which may result from the conflict between the bacteria and the protective agents in the blood (white blood cells or leucocytes).

Bacteria are simple forms of animal or vegetable life, many of them one celled in structure. They propagate by dividing at an extraordinary rate when they find themselves in a suitable soil. Moisture and a favourable temperature are necessary for their growth. Freezing inhibits their growth, and intense heat destroys them. The majority of these organisms are harmless to man. Millions of them are found at any time in the mouth or in the intestinal tract, either serving a useful purpose or doing no harm.

Many of the harmful types are also normally found in small numbers in the body. It is only when they become numerous as the result of the lowering of the body resistance that they become a danger.



The natural resistance of the body to the activities of harmful bacteria is broken down either by a large dose of the infecting agent or by the fact that the person is in a weakened condition because of malnutrition or of failure to recover fully from some previous illness.

Certain people are immune to certain diseases—that is to say, they are not susceptible to these diseases. This immunity may be natural or acquired. No satisfactory explanation has been found for the fact that, despite the frequency or intimacy of contact, certain persons do not take certain diseases. This constitutional ability to resist a disease is called natural immunity. Acquired immunity may result from a previous attack of the disease or from preventive measures designed to bring about immunization.

**Spread of Disease.** Theories as to how outbreaks of communicable diseases are caused are as old as the study of medicine. Retribution for offences to the local deity, the spells of witches, divine visitations, miasmas, night air, sewer gas—all have been held in the past to be explanations of the periodic epidemics of contagious disease. We now know that these diseases are sporadically present, only becoming epidemic when a large enough number of non-immunes are gathered together in one community.

Communicable disease is spread in the main by the direct contact of a susceptible person with a known or undiagnosed case. A few cases result from contact with healthy carriers—that is from persons who, while they have never had the disease, harbour the specific organism in the nose or the throat and, when circumstances permit, act as agents in its spread. Convalescent carriers are an important source of contagion; after apparent recovery they are still factors in the spread of disease. Typhoid, scarlet fever, and diphtheria are commonly spread by the convalescent carrier.

Infected water, milk, dairy products, and certain vegetables which are eaten raw are sometimes the means of spreading such diseases as typhoid, cholera, and dysentery. The importance of clothing and articles of furniture in spreading contagion is negligible, except when these are soiled by the discharges of a patient.

The organisms responsible for certain diseases, notably tuberculosis, are so constituted as to permit of them living for long periods in sheltered places, such as the dust in rooms occupied by careless patients.

Most germs resemble animals in that they need oxygen in order to live. One exception to this rule is the tetanus bacillus, which is anaerobic in character.

**Modes of Prevention.** The control of contagion has been the objective of municipalities and states ever since the communicable nature of certain diseases was discovered. First we hear of the quarantine of cities, institutions, ships, and homes; then of the isolation of the patient. Fumigation by the

burning of spices, incense, and other pungent herbs was introduced centuries before man knew of the germ theory. Some people still use such fumigation to-day. All that it has to commend it is its antiquity. Such forms of disinfection as aim at continuous cleanliness are to be fostered, but any measure which places the emphasis on the odour of the disinfecting agent, instead of on its power to destroy the causative organism, is not only useless but definitely harmful.

While vaccination against smallpox was known to be an effective immunization measure one hundred years before Pasteur established the theory of the bacterial origin of certain diseases, it was not until his theory was widely accepted by scientists that vaccination was generally adopted as a specific preventive measure.

With the discovery of the cause of a given disease, investigators have immediately sought an antidote to the activities of the invading organism. The isolation of the diphtheria bacillus brought diphtheria antitoxin. The recognition of the spirochete as the cause of syphilis brought salvarsan. The discovery that the anopheles mosquito was the intermediary host in malaria brought measures designed for its destruction.

Immunization is usually carried out by the inoculation of the potential patient, either with graduated doses of the dead organism (vaccination); or by the injection into the blood stream of anti-bodies which have been developed either in a convalescent patient or in a treated animal; or by the administration of small doses of the treated toxin, which is the end-product resulting from the activities of toxin-producing germs. The immunity conferred varies in its duration from the long period resulting from vaccination for smallpox to ten days when diphtheria antitoxin is given.

An intimate knowledge of the various methods of immunization and the protection thus conveyed should be possessed by every teacher. Literature on the subject may be obtained from the local or provincial health authorities.

**Some of the Common Diseases.** Measles is the most prevalent of all communicable diseases; probably 80 per cent. of all children have had this disease by the time they reach adolescence. Mumps, whooping-cough, chicken-pox, and German measles are next in order. Probably 12 per cent. of children have had scarlet fever before the end of their school career; and before the introduction of toxoid immunization 6 per cent. used to have diphtheria. Infantile paralysis and epidemic meningitis are much less common.

Correct diagnosis of these diseases in the early stages permits not only of the prompt isolation of the patient, but of his early treatment; and early treatment in all major communicable diseases increases the patient's chances of recovery.

In measles, whooping-cough, and scarlet fever, the communicability of the disease decreases rapidly with the number of days which have elapsed since the onset.



Certain of the commoner diseases have associated symptoms which are fairly characteristic. In measles, the congestion of the eyes, nose, and throat, and a dislike for light are early signs. In whooping-cough, a spasmodic type of cough, worse at night, with a history of previous colds is fairly typical. In mumps, the swelling of the parotid gland below the lobe of the ear, and in chickenpox the presence of irregularly shaped vesicles or scabs on the back and face are characteristic symptoms.

The onset of scarlet fever is usually sudden and accompanied by high fever, vomiting, and sore throat, closely followed by the appearance of a fine, bright-red, impalpable rash. In diphtheria, sore throat, enlarged tender cervical glands, membranous patches on the tonsils, and signs of toxæmia (headache, lethargy) are usually present.

Familiarity with the early symptoms and premonitory signs of the commoner diseases of childhood will materially aid the teacher in his efforts to lessen the incidence of communicable disease in the class-room.

**Regulations.** Certain regulations designed to aid in the control of communicable diseases have been laid down by the central health authorities. These regulations are mandatory in character, and appropriate penalties have been provided for failure to carry them out.

It is the responsibility of the teacher or the principal to exclude from school all children suspected of having infectious disease, and to notify the local health authorities of such action. A teacher is not permitted to allow any child suspected of having had a communicable disease to return to school without a certificate to the effect that he is free from contagion; this certificate to be signed by the Medical Officer of Health for the community.

Because of the intimacy of the relationship between teacher and pupil, special restrictions are placed on teachers who have been exposed to communicable disease.

Under the regulations, contacts are divided into those who are declared to be immune and those who are suspected of being non-immune. Those who are not susceptible are given much more leeway in their school attendance than those who are considered liable to attack. With two or three of the mildest of these diseases, no restrictions are placed on the activities of children who are well, even when they come from homes where the disease is known to exist.

The following notes have been compiled from "Regulations for the Control of Communicable Disease" for ready reference by the teacher.

**Chickenpox, German Measles, Mumps.** These are the less serious communicable diseases; placarding is not required, nor are contacts quarantined except those whom the M.O.H. may designate in the case of chickenpox. The patient is isolated as follows: chickenpox, until all scales disappear and all

lesions are healed; German measles, eight days from the appearance of the rash; mumps, three weeks from the onset if all swelling has subsided.

The diseases listed below are all placardable. Medical Officers of Health usually advise the removal of the patient, or arrange a change of residence for those not affected. This is because of the great difficulty of effectively isolating the patient at home.

**Cerebro-Spinal Meningitis.** An attack does not mean immunity, therefore all contacts must be quarantined for ten days after the last exposure. Patients should be isolated until clinical recovery.

**Diphtheria.** A previous attack does not necessarily give immunity, and all contacts must show one negative culture satisfactory to the Medical Officer of Health; where examination of swabs is impossible, the contact is quarantined for seven days after the last exposure.

The patient may be released on the following conditions:

(a) If examination of the swabs is possible, the patient is released after ten days from the date of onset, if two swabs taken twelve hours apart show a negative culture satisfactory to the Medical Officer of Health.

(b) If examination of the swabs is not possible, the patient is released three weeks from the onset, if convalescence is complete, and if there is no sore throat or discharge from the nose or the ears.

(c) Carriers are isolated until two swabs taken twelve hours apart show a negative culture satisfactory to the Medical Officer of Health; in the case of chronic carriers (those who are still carriers after seven days) a virulence test will be required.

**Measles.** A previous attack gives immunity, and adults are not generally susceptible; contacts subject to quarantine are only those non-immunes who are teachers, children, or students. The patient is isolated for seven days from the appearance of the rash.

**Poliomyelitis (Infantile Paralysis).** A previous attack gives immunity; however, all contacts are subject to quarantine. The patient is released from isolation three weeks from onset if the temperature is normal.

**Scarlet Fever.** A previous attack gives immunity; school children and teachers, even though they have had the disease, are usually required to change residence if the patient is cared for at home. Contacts who have not had the disease are quarantined for seven days from the last exposure. The patient is released from isolation twenty-eight days after the appearance of the rash if there is no sore throat and no discharge from the nose or ears.

**Smallpox.** All non-immunes must be quarantined for sixteen days from the last exposure. There is no quarantine for immunes, namely, (1) persons who have had the disease; (2) persons who have natural immunity, as shown



by the so-called immunity reactions; (3) persons who have acquired immunity by successful vaccination either at the time or within seven years. The patient is isolated for not less than twenty-one days; he is released then only if all scabs have fallen off and all lesions are healed.

**Whooping-cough.** A previous attack gives immunity, and adults are not generally susceptible; contacts subject to quarantine, therefore, are those non-immunes who are children under twelve years of age. The period of quarantine is fourteen days. The patient is released from isolation three weeks after the commencement of the "whoop."

### DEFINITION OF TERMS

**Contact.** A person known to have been sufficiently near to an infected person to have been exposed to transfer of infectious material directly or by articles freshly soiled with such material.

**Carrier.** A person who, without symptoms of a communicable disease, harbours and disseminates the specific organisms.

**Isolation.** Isolation means that persons who are suffering from a communicable disease, or who are carriers of infecting organisms, shall be separated from other persons in such manner as will prevent the direct or indirect conveyance of the disease or infecting organisms to others.

**Quarantine.** Quarantine means the restriction of persons who have been exposed to a communicable disease to their places of residence for a period of time equal to the incubation period of the disease to which they have been exposed.

**Immune.** A person who is not susceptible to a given communicable disease.

**Non-Immune or Susceptible.** A person who is not known to be immune to a given communicable disease by natural or artificial process.





## Glossary

- Adenoid**—spongy tissue at back of the nose.
- Adolescence**—the period of development between childhood and adult life.
- Afferent fibre**—the nerve fibre which conducts impulses to the spinal cord or to the brain.
- Alimentary**—performing functions of nutrition.
- Alveoli**—minute sacs found in the lungs.
- Amino-acids**—organic acids which are the basis of the protein molecule.
- Anatomy**—science of the structure of the body.
- Anaemia**—a deficiency either in the quantity or the quality of the blood, resulting in unhealthy paleness.
- Anterior chamber**—the space between the cornea or transparent front part of the eye and the coloured membrane or iris.
- Anti-toxin**—a substance formed in the body fluids which is specifically antagonistic to a toxin or poison.
- Aphasia**—a defect in or loss of the power of expression by speech, writing, or signs.
- Apoplexy**—sudden paralysis caused by an effusion of blood into the brain.
- Arytenoid**—shaped like a pitcher or jug.
- Assimilation**—the transformation of food substances and their utilization by organized tissues of the body.
- Astigmatism**—a structural defect in the cornea of the eye, as the result of which light rays are not brought to a proper common focus.
- Audiometer**—a device to test hearing power.
- Auditory**—concerned with hearing.
- Auditory canal**—the short funnel-shaped canal leading from the outside to the drum of the ear.
- Auditory nerve**—the nerve of hearing.
- Auricle**—the term used to describe the upper two cavities of the heart.
- Axon**—the projection of a nerve cell continuous with the core or central part of a nerve fibre which carries messages from the cell.
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- Bacillus** (plural **Bacilli**)—a rod-shaped bacterium.
- Bacterium** (plural **Bacteria**)—a class of micro-organisms, of vegetable origin.
- Biconvex body**—a body having two convex surfaces.
- Bile**—the substance secreted by the liver.
- Blepharitis**—inflammation of the hair follicles of the eyelashes.
- Bronchi**—main divisions of the wind-pipe.
- Bronchial tubes**—smaller divisions of the bronchi.
- Bronchitis**—inflammation of the mucous membrane of the wind-pipe and its divisions.
- By-products**—materials produced incidentally in the manufacture of some other material.
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- Calcification**—deposition of calcium salts in the tissues.
- Calorie**—unit of heat.
- Carbohydrates**—the compounds made up of carbon, in groups of six atoms, with hydrogen and oxygen in the proportion to form water.
- Caries (dental)**—decay of the teeth.
- Carious**—affected with caries.
- Cartilage**—white elastic substance attached to articulating bone surfaces and forming certain parts of the skeleton.

- Cellulose**—an insoluble material forming the framework of plant structures.
- Cementum**—calcified connective tissue closely resembling bone, covering the dentine of the roots of the teeth.
- Centimeter**—a metric unit of measurement equal to about two-fifths of an inch.
- Cerebellum**—that portion of the brain behind and below the cerebrum or larger anterior part.
- Cerebral**—pertaining to the cerebrum or large front part of the brain.
- Cerebral cortex**—external layer of the brain, which is composed of gray matter.
- Cerebrum**—larger anterior part of the brain.
- Choroid coat**—the middle coat of the eyeball.
- Chromosomes**—subdivisions of the nucleus of a germ cell, supposed to be a factor in the transmission of hereditary characteristics.
- Ciliary body**—that part of the choroid coat of the eye which includes the ciliary muscle and processes.
- Clavicle**—the collar bone.
- Cleft-palate**—failure of the two sides of the palate to unite.
- Coccus**—a round-shaped bacterium.
- Cochlea**—a small spiral bone of the internal ear.
- Colloidal**—of the nature of a colloid (gelatinous).
- Colour blindness**—diminished ability to discern differences of colour.
- Combustion**—development of heat associated with the oxidation of organic tissues.
- Compensatory**—counterbalancing of defect of structure or function.
- Concave**—with surface curved like the interior of a circle or sphere.
- Conception**—the fertilization of the ovum.
- Cones-retinal**—minute perceptive organs near the outermost layer of the retina of the eye.
- Congenital**—existing at or before birth.
- Connective tissue**—tissue which forms the ground substance or framework of an organ.
- Conjunctivitis**—inflammation of the delicate membrane which lines the lids of the eyes and covers the eyeballs.
- Contagion**—the spread of disease through contact.
- Contractile**—contracting under the proper stimulus, capable of or producing contraction.
- Convex**—curved like the outside of a circle.
- Convolutions**—the elevated parts of the brain surface marked off by fissures.
- Co-ordination**—harmonious working together of parts and normal sequence of functions.
- Cornea**—the white of the eye or the transparent anterior part of the eye.
- Cortex**—outer or superficial layer.
- Cranial nerves**—nerves coming directly from the brain.
- Crystalline lens**—the transparent lens behind the pupil of the eye.
- Cutaneous**—relating to the skin.
- Cuticle**—the outer layer of skin (same as epidermis).
- Deciduous**—first or temporary teeth.
- Deleterious**—injurious.
- Delirium**—disordered mental state with excitement and illusions.
- Dendron**—a branching projection of protoplasm from a nerve cell carrying messages to the cell.
- Dentine**—calcified connective tissue making up the bulk of the tooth.
- Dentition**—the process or time of cutting the teeth; the kind, number and arrangement of teeth.
- Denudes**—removes, lays bare.
- Dermatitis**—inflammation or infection of the skin.



- Dermis**—that part of the skin which is found immediately beneath the outside layer.
- Dialysis**—the separation of substances from a mixture by means of their unequal diffusion through a porous membrane.
- Diaphragm**—a partition between the thorax and abdomen composed of muscle and fibrous tissue.
- Digestion**—the conversion of food into assimilable matter.
- Dissemination**—spreading about.
- Ductless glands**—gland-like organs having no true duct but the secretions of which directly enter the blood-stream.
- Dysfunction**—abnormality or imperfect functioning.
- Eczema**—a skin disease which may result from any one of a variety of causes.
- Efferent**—leading away from the centre.
- Embryo**—a term used to describe the unborn offspring.
- Embryonic muscle cells**—muscle cells which are not fully developed.
- Emmetropia**—perfect vision.
- Enamel**—the white covering of the crown of the teeth.
- Epidermis**—the outermost layer of the skin or cuticle.
- Epithelium**—cellular substance of the skin and the mucous membrane.
- Equilibrium**—a state of balance.
- Eustachian tube**—canal leading from the middle ear to the naso-pharynx.
- Excretion**—expelled useless matter.
- Extensile**—capable of being stretched.
- Facial nerve**—the seventh cranial nerve supplying the face, part of the ear, palate, and tongue.
- Facilitation**—the promotion or hastening of any natural process.
- Ferment**—a substance which is capable of causing physical or chemical change in other substances with which it comes in contact.
- Fibre**—an elongated and thread-like structure of organic tissue.
- Fibril**—a minute fibre or filament.
- Fibrous tissue**—the connective tissues of the body composed of yellow or white parallel fibre.
- Fissure**—a narrow slit or cleft.
- Focal infection**—infection spreading from a definite area.
- Foetal**—pertaining to the unborn child.
- Foetus**—a more advanced form of the unborn offspring of animal life.
- Follicle**—a small sac or gland.
- Gall-bladder**—the reservoir for bile.
- Gene**—a hereditary germinal factor or unit in the chromosome, which carries a hereditary transmissible characteristic.
- Glucose**—the end-product of the digestion of starch or sugar.
- Glycogen**—glucose which is not required by the body at the moment, but is stored in the liver.
- Hare-lip**—fissure of the upper lip.
- Haemoglobin**—the colouring matter of red blood corpuscles.
- Hormone**—a chemical substance which is formed in one organ and carried by the blood-stream to another organ upon which it exerts a stimulating effect.
- Hyperopia**—far-sightedness.
- Hysteria**—a mental disturbance characterized by lack of control over emotions and acts.
- Ichthyosis**—disease characterized by dryness, roughness, and scaliness of the skin.
- Idiocy**—the most extreme form of mental deficiency.

**Immunization**—the process of rendering a person immune.

**Impetigo contagiosa**—a contagious skin disease most commonly found upon the face.

**Inanition**—a physical condition resulting from lack of food (starvation).

**Infection**—spread of disease of microbic origin.

**Infra-red rays**—rays of energy beyond the limit of vision and below the red rays of the spectrum; otherwise known as heat or radio rays.

**Inorganic salts**—salts of mineral origin.

**Intercostal muscles**—the muscles situated between the ribs.

**Insanity**—synonymous with mental disease.

**Insomnia**—sleeplessness.

**Intestines**—the lower part of the alimentary canal from the end of the stomach to the outlet.

**Intra-uterine**—in the uterus.

**Involuntary movement**—movement independent of direction from the will.

**Iris**—the coloured membrane of the eye behind the cornea and perforated by the pupil.

**Jacob's membrane**—that section of the retina of the eye which contains the rods and cones and is concerned with the perception of light and colour.

**Labyrinth**—an intricate enclosure; part of the internal ear.

**Large intestine**—the membranous tube, about five feet in length, which joins the end of the small intestine with the outlet.

**Larynx**—that part of the air passage between the tongue and the trachea which contains the vocal cords.

**Ligaments**—tough bands connecting bones or supporting organs.

**Lipins**—organic substances which are insoluble in water but soluble in alcohol, ether, and other solvents, and which have a greasy feeling.

**Macula lutea**—the point of clearest vision in the centre of the retina of the eye.

**Malnutrition**—imperfect assimilation and nutrition.

**Malocclusion**—faulty occlusion.

**Malposition**—wrong or faulty position.

**Mastication**—the act of chewing.

**Masturbation**—self-abuse.

**Mental deficiency**—below normal intellectual development dating to the earliest years of childhood.

**Mental disease**—a well-defined disturbance of one or more of the ordinary activities which are normally found in the healthy-minded individual.

**Metabolism**—the sum of the chemical changes in living cells by which energy is provided for vital processes and activities.

**Micro-organism**—an organism too small to be seen except with the aid of a microscope.

**Middle ear**—the cavity extending from the ear-drum to the internal ear, containing the three small bones which conduct the sound waves.

**Molecule**—a minute unit of matter; an aggregation of atoms.

**Motor area**—the areas of the brain controlling movement.

**Mucin**—the main constituent of mucus, the sticky, watery secretion of the mucous glands.

**Mucous membrane**—the lining membranes of the canals and cavities which communicate with the external air.

**Musculature**—the muscular apparatus of the body or of any part of the body.

**Mutes**—persons unable to speak.

**Myope**—a person with short-sightedness.

**Myopia**—short-sightedness.



- Nasal mucosa**—the mucous membrane lining the nose.  
**Naso-pharynx**—that part of the air passage between the nose and the mouth.  
**Nerve fibrils**—minute fibres of nerve cells.  
**Nerves**—cord-like organs which convey impulses.  
**Nervous system**—all the nerves, spinal cord, and brain.  
**Neurosis**—a mild form of impaired mental health.  
**Neurotic**—pertaining to neurosis.  
**Noxious gases**—harmful gases.  
**Nucleus**—the core or centre of a cell.
- Ocular**—pertaining to the eye.  
**Occlusion**—the contact of the teeth of both jaws when closed.  
**Oesophagus**—the canal which conveys food from the mouth to the stomach.  
**Olfactory**—pertaining to the sense of smell.  
**Optic nerve**—the nerve of sight.  
**Organ of Corti**—a collection of cells in the internal ear through which sound is transferred to the auditory nerve.  
**Orthodontia**—correction of dental irregularities.  
**Orthopedic**—pertaining to the correction of deformities.  
**Osmosis**—passage of fluids through a porous membrane leading to mutual diffusion.  
**Ossification**—the formation of bone.  
**Osteoblasts**—cells associated with the development of bone.  
**Otitis-media**—inflammation of the middle ear.  
**Over-tones**—any of the tones other than the fundamental tones.  
**Oxyhaemoglobin**—haemoglobin charged with oxygen, as in arterial blood.
- Parasympathetic**—the craniosacral division of the part of the nervous system which has independent function.  
**Pathological**—pertaining to diseased conditions.  
**Pathology**—a term used to describe the condition of an organ or part of the body following disease.  
**Parasite**—a plant or animal living upon a living organism.  
**Pellagra**—a diseased condition due to inadequate diet.  
**Pepsin**—a ferment of the gastric juice which aids in the digestion of proteins.  
**Pericementum**—the tissue which occupies the space between the root of a tooth and the hollow in the jaw.  
**Peristalsis**—wave-like movements by which the alimentary canal propels its contents.  
**Pharynx**—the part of the alimentary canal between the nose, mouth, and oesophagus.  
**Phlegmatic**—sluggish or apathetic.  
**Physiology**—the science which deals with the functions of the organs of the body.  
**Phobia**—a fixed morbid fear, which in a normal person would be considered unreasonable and unwarranted.  
**Pitch**—intensity; acuteness of a sound or tone.  
**Plasma**—the fluid portion of the blood.  
**Pleura**—the membrane which surrounds the lungs and lines the thorax.  
**Pleurisy**—inflammation of the pleura.  
**Pneumonia**—inflammation of the lungs.  
**Prematurity**—birth before the proper time.  
**Prophylaxis**—preventive treatment.  
**Proteins**—a group of complex substances found in animal and vegetable tissues, combinations of amino-acids and their derivatives.

**Protoplasm**—granular material which is the essential constituent of the living cell.

**Psychosis**—synonymous with mental disease.

**Pupil**—the opening in the centre of the iris of the eye.

**Pulp**—occupies the central portion of the tooth; composed of connective tissues, nerves, and blood vessels.

**Reflex**—a response to a stimulus or excitation without any intervention of consciousness.

**Refraction**—the deviation of light in traversing obliquely a medium of varying density.

**Rennin**—the milk-curdling ferment found chiefly in gastric juice.

**Retina**—the innermost coat and perceptive structure of the eye, formed by the expansion of the optic nerve.

**Rickets**—disease of infancy and early childhood in which there is an insufficient amount of bone-forming material deposited, resulting from an inadequate diet.

**Ringworm**—a parasitic skin disease occurring on the face, scalp, or body.

**Salivary glands**—glands situated in the mouth which secrete saliva.

**Sarco-lactic acid**—an acid found in the muscles, blood, and urine, following muscular activity.

**Sarcoplasts**—embryonic muscle cells.

**Scabies**—a contagious skin disease due to the itch-mite.

**Sclera**—same as sclerotic coat.

**Sclerotic coat**—the membrane, which with the cornea forms the external coat of the eye.

**Scurvy**—a disease characterized by hemorrhages, due to an inadequate diet.

**Sebaceous glands**—small glands situated in the true skin, secreting a greasy, lubricating substance.

**Sensory**—pertaining to sensation.

**Septum**—a dividing wall or partition.

**Serous**—like serum, or pertaining to serum; watery.

**Skeletal**—pertaining to the skeleton.

**Skeleton**—the bony framework of the body.

**Small intestine**—that portion of the membranous tube leading from the stomach to the large intestine. In the human body it is about twenty-eight feet long, is smaller in dimension than the large intestine, and takes an active part in the digestion and absorption of food.

**Spasm**—a sudden, violent, involuntary contraction.

**Spermatozoan**—the male generative cell.

**Spirella**—a bacterium of a spiral or corkscrew shape.

**Stasis**—a slowing-up or stoppage.

**Subcutaneous**—situated beneath the skin.

**Sympathetic nervous system**—a group of nerves extending control to those parts of the body the activities of which are not influenced by the will.

**Sweat glands**—glands secreting perspiration.

**Tantrums**—marked display of temper or petulance.

**Terminals**—ends.

**Thyroid cartilage**—the shield-shaped cartilage of the larynx, commonly known as the "Adam's Apple".

**Timbre**—the musical quality of a tone or sound.

**Tonus**—tone; normal condition of tension.

**Trachea**—the windpipe, the tube which permits of the passage of air from the larynx to the bronchi.

**Trauma**—wound or injury.



**Tuberculosis**—the disease caused by the bacillus tuberculosis, characterized by the formation of tubercles or masses of small rounded nodules in the tissues.

**Tympanum**—the ear-drum.

**Ultra-violet rays**—rays of energy beyond the limit of vision and above the violet rays; commonly known as X-rays.

**Uterus**—the womb; a hollow organ in which the embryo grows.

**Ventricle**—a cavity; the term is applied to the two lower and larger cavities of the heart and to certain cavities of the brain.

**Venous blood**—blood carried by the veins.

**Vertebrae**—the thirty-three bones making up the spinal column.

**Vestibule**—the oval cavity of the internal ear forming the approach to the cochlea.

**Visual acuity**—sharpness or clearness of vision.

**Vital capacity**—the quantity of air a person can breathe out after a full inspiration.

**Vitamins**—Certain accessory food factors, the chemical composition of which is as yet unknown, but the inclusion of which in the diet is essential.

**Volitional**—at the power of the will; voluntary.

**Xerophthalmia**—a disease of the eye caused by the absence of vitamin A from the diet.













